



American Foundryman

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Association Possibilities



AS your president for the coming year, in this our first message to you we wish to pay tribute to the leadership of Henry Washburn over the past year. The 44th annual convention closed a year of activities under his direction which set a new high in accomplishment, in membership, in chapter work and in promoting the recognition of the foundry industry as living and progressive by all industries of the country.

To the many members who cooperated in the work of the Association this past year and to others, we ask your cooperation in aiding us to carry the Association to new heights of endeavor. We realize that it will be difficult to excell the record of last year, but with our growing membership and more and more members willing to contribute of their efforts, their experience through the technical committees, in preparing papers and by chapter work we feel certain that this can be done.

With eighteen chapters established since 1934 and with others in prospect, our possibilities for bringing the benefits of the A.F.A. to greater numbers is increasing. In this connection, we would like to stress the opportunities afforded the chapters in promoting educational activities through chapter meetings and lecture courses for the younger men coming into the industry. These youngsters are eager to avail themselves of the knowledge and experience of those in foundry work older than themselves. Service on our research and technical committees offers splendid possibilities to these youngsters to benefit themselves as well as to advance the industry.

The work of the Association is attracting new members and we believe that this year, through our combined efforts, our membership can be greatly increased as we realize that many, not now members, will find the Association offers them much of value. The results of the membership drive initiated at the time of the convention show that there are many who, when the work of the Association is brought to their attention, are glad to join with us in making this Association the greatest in its field.

We say again—

**"Coming together is a beginning
Working together is progress
Keeping together is success"**

A handwritten signature in cursive script that reads "L. N. Shannon".

L. N. SHANNON, President

L. N. Shannon, elected president at the (1940) convention of the A.F.A., is vice president, Stockham Pipe Fittings Co., Birmingham, Ala. The first president of the Association from the south, he has served as vice president (1939-40), as director (1936-39), on many committees and was largely instrumental in forming the Birmingham District Chapter of which he served as first chairman.

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+

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*Members, Executive Committee.



American Foundryman

C O N T E N T S

June, 1940

Volume 2

Number 6

	Page
Association Possibilities, by President Shannon - - - - -	Inside Front Cover
Chicago Convention Excels - - - - -	2
Non-Ferrous Division Elects Officers - - - - -	5
Five Members Honored - - - - -	6
Pattern Division Authorized - - - - -	7
Old Timers at Convention - - - - -	8
Annual Address of President, by H. S. Washburn - - - - -	9
Association Elects Officers and Directors - - - - -	10
Sheehan Submits British Exchange Paper - - - - -	13
Chapter Activities - - - - -	14
Research and Developments in Cast Metals, by C. H. Lorig - - - - -	19
New Members - - - - -	22
Abstracts of Foundry Literature - - - - -	24
Schedule of June Chapter Outings - - - - -	25

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Chicago Convention Excels in All Ways

FROM all standpoints the 44th Annual Convention and Foundry Show held in Chicago, May 4 to 10, will go down in the records as the best attended, with the show excelling those of previous years in interesting new equipment, with the papers and reports at the convention sessions the most instructive and the provisions for entertainment and plant visitation the most enjoyable and profitable on record.

The record attendance of over 7,000 at the Preview Day, May 4, and the registration of some 8,000 members and guests during the following week, with 300 ladies participating in the events for the ladies, all speak highly of the untiring efforts of the hundreds of members cooperating in making the convention of the Association truly a National Foundry Week. While attendance from foreign countries was small due to conditions abroad, the record attendance of Canadian members and the many from both the west and east coasts and south and points in between reflects the influence of the chapters and the growing importance of the work of the Association members.

Annual Meeting and Awards Address

The high spot of the meetings was the Annual Business and Awards meeting. Executive Vice President Hoyt reviewed the activities of the Association during the past year and reported the many invitations received from cities to hold the 1941 convention. These invitations have been referred to the Board of Directors for deciding on the time and place of the 1941 meeting.

The report of the nominating committee to present the names of members to serve on the 1941

nominating committee was approved with the election of the following:

C. V. Nass, Fairbanks, Morse & Co., Beloit, Wis.

H. F. McFarlin, Lunkenheimer Co., Cincinnati, Ohio.

R. K. Glass, Republic Steel Co., Buffalo, N. Y.

F. A. Melmoth, Detroit Steel Castings Co., Detroit, Mich.

As alternates:

M. F. Doty, Clark Equipment Co., Buchanan, Michigan.

F. L. Wolf, Ohio Brass Co., Mansfield, Ohio.

M. W. Pohlman, Pohlman Foundry Co., Buffalo, New York.

S. C. Wasson, National Malleable & Steel Casting Co., Indianapolis, Ind.

The report of election of new officers and directors was presented, naming as president, L. N. Shannon; vice president, H. S. Simpson; and directors, G. W. Cannon, B. D. Claffey, Harold J. Roast, L. P. Robinson and H. S. Washburn. Biographical sketches of those elected are given elsewhere in this issue.

Gold medal and honorary life membership awards were made to F. K. Vial, N. K. B. Patch, F. A. Melmoth, H. W. Dietert and George Long, as announced in the May issue and also reported elsewhere in this issue.

The annual presidential address as given by President Washburn is reported in full on the following pages, while complete details of this business session will appear later in TRANSACTIONS.

The Association was fortunate in securing C. E. Wilson, executive vice president, General Motors

Members of Association Gather Together at Annual Dinner, Palmer House, Chicago.



Corp., to present the third annual Board of Awards address. Mr. Wilson took as his theme "Industry's Responsibility to Youth," a subject which was most appropriate for this gathering as the whole meeting stressed the place of youth in industry. This excellent and timely address by Mr. Wilson will later be reported in full to the membership.

Technical Sessions

A most important phase of the convention, the technical sessions will be reported later in the Transactions, with the papers and discussions. These sessions included two shop courses on sand control and gray iron melting, round table luncheon meetings of the steel, malleable, gray iron and non-ferrous divisions, round table discussions on foundry costs, time study and foreman training and 16 other regular sessions covering plant equipment, sand research, patternmaking, safety and hygiene, malleable, steel, non-ferrous and gray iron research and production methods.

Seven hundred members were present at the three crystallization demonstrations by Dr. C. W. Mason, Cornell University. Dr. Mason, by melting materials on slides, projected on a large screen what was shown under a microscope, these materials freezing and forming crystals, eutectic formations and allotropic transformations. These

C. E. Wilson, General Motors Corp., Presents Awards Lecture at Convention.



demonstrations were most instructive to those interested in cast metal formations.

Some forty instructors of engineering schools attended the annual dinner for those men interested in engineering and vocational instruction. In addition to short talks by Dean S. C. Hollister, Cornell University, and Dean C. J. Freund, University of Detroit, two instructors and two students from the foundry departments of the Chicago technical high schools presented discussions of the aims, purposes and results obtained.

Annual Dinner

The annual dinner, an experiment in its type, proved the big drawing card of the entertainment features of the week. At the speakers' table were seated the national officers, members of the Board



Some Convention and Show Side-lights (Upper Left) Malleable Round Table Luncheon Meeting. (Upper Right) Preview Day Crowd Entering Exhibition Halls (Left Center) One of the Many Sessions (Right Center) A.F.A. Booth, Convention Hall (Lower Left) Junior Foundrymen Exhibiting Work at Show (Lower Right) Non-Ferrous Division Annual Dinner Group.



Busses Loading for Convention Plant Visitation Trip to Wisconsin Steel Co.

of Awards, medallists, division chairmen, C. E. Westover, chairman of the Chicago Chapter, and P. V. Martin, chairman of the Chicago Chapter dinner committee. Again a record was set for attendance, there being 900 members and their ladies present. Following the dinner, President Washburn made a brief address describing the history of the A.F.A. medals. He then introduced those at the speakers' table, and past President W. H. McFadden, one of the two living donors of Award funds, after which Mr. Westover, as chairman of the chapter, host to the convention, welcomed the members. Mr. Martin was then asked to take charge of the evening's entertainment and the members were treated to an outstanding and enjoyable floor show followed by a dance which lasted well into the morning.

The occasion was by popular vote acclaimed the most successful affair of its kind in the history of the Association and well deserving of praise as an example of the Chicago Chapter Annual Ladies' Night on which it was modelled.

Chapter Officers' Breakfast

Forty chapter officers met together at a "Get Acquainted" breakfast during the convention. Fourteen of the eighteen chapters were represented. While no business was scheduled for transacting, Vice President Shannon addressed the group on general activities for the coming year and on the membership campaign to be carried out by this convention.

Castings and Patterns of Apprentice Contest on Display at Convention.

Photo—Courtesy E. F. Wiechmann, Whiting Corp.



Plant Visits

Plant visitation, one of the major features of A.F.A. conventions, was well handled by a Chicago Chapter committee, providing information on the many foundries and industrial plants of the district open for inspection. Some 300 members on Monday afternoon engaged in a conducted tour of the works of the Wisconsin Steel Division of the International Harvester Co., when they saw the blast furnaces, coke ovens and steel making operations in action. On the return trip, the busses made a stop to inspect the foundry exhibit of the Museum of Science and Industry. While the section housing this foundry exhibit is not yet open to the general public, the Museum officials had it in operation for the benefit of the many visiting foundrymen who had heard of it through reports of those attending the recent regional foundry conference of the Chicago Chapter.

Apprentice Patternmaking and Molding Competition

Some eighty foundries and pattern shops had apprentices competing in the annual contest sponsored by the apprentice committee of the Association. This year chapters of the Association, namely, Northern Ohio, Wisconsin, Detroit, St. Louis, Quad City, held local contests and submitted entries along with many individual companies.

The judges of the national contest awarded the prizes in each group as follows:

Gray Iron Molding

1st—Thomas F. Murphy, Brown & Sharpe Mfg. Co., Providence, R. I.

2nd—Fredric Edstrom, International Harvester Co., Rock Island, Ill.

3rd—Harold Downey, International Harvester Co., Rock Island, Ill.

Steel Molding

1st—Melvin Amole, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

2nd—Robert Darmour, Crucible Steel Castings Co., Cleveland, Ohio.

3rd—Joe Birkenheuer, Crucible Steel Castings Co., Cleveland, Ohio.

Non-Ferrous Molding

1st—Emmett Klessig, Wisconsin Aluminum Foundry Co., Manitowoc, Wis.

2nd—Steve Garbowitz, Allis-Chalmers Mfg. Co., West Allis, Wis.

3rd—Robert Ashley, Waukesha Foundry Co., Waukesha, Wis.

Patternmaking

1st—John L. Mahon, H. & B. American Machine Co., Pawtucket, R. I.

2nd—Marvin Bergstrom, Kearney & Trecker Co., West Allis, Wis.

3rd—Alan Miller, American Steel Foundries, East Chicago, Ind.

Photo—Courtesy E. F. Wiechmann, Whiting Corp.



Visiting Foundrymen Inspect Apprentice Patterns.

The judges realized that much depended on local conditions and trade practices prevailing in the various shops but had to base their decisions on points as set up by the contest committee. All the judges expressed the opinion that the workmanship and skill displayed by the contestants proved that foundry apprentice training is on the upgrade and the work of all the boys deserved the greatest praise. Those who viewed the patterns and castings on display found that a comparison of the methods used offered a valuable study.

Prizes to the winners in the contest will be made available by the Association from funds provided by the Awards Board.

Junior Foundrymen of America

Of equal interest with the apprentice contest display at the show was the exhibit of work of the foundry students of the Chicago technical high schools. Under the direction of R. W. Schroeder, Crane Technical High School, assisted by members of the Foundry Instructors' Club of the City Schools, boys from the various schools put on a working demonstration of melting, molding and casting. These boys are members of the Junior Foundrymen of America, an organization of students majoring in foundry practice as provided under the Smith-Hughes Act.

Non-Ferrous Division Elect New Officers

AT the regular annual meeting of the Non-Ferrous Division of the American Foundrymen's Association, held Tuesday, May 7, during the Annual Convention, W. J. Laird, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was unanimously elected chairman of the division for 1940-42 and W. H. Romanoff, H. Kramer & Co., Chicago, was elected vice chairman. Mr. Laird succeeds Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, P. Q., Canada, who served during the years 1938-40. Mr. Roast was elected a director of the National Association at the Annual Business Meeting.

The following were elected members of the advisory committee to serve for a period of four years:

E. F. Hess, Ohio Injector Co., Wadsworth, Ohio.

H. B. Gardner, Bureau of Standards, Washington, D. C.

J. W. Kelin, Federated Metals Division, American Smelting & Refining Co., St. Louis, Mo.

The new officers had been nominated for their respective positions by a nominating committee composed of:

Sam Tour, Lucius Pitkin, Inc., New York, *chairman*.

M. E. Brooks, Dow Chemical Co., Midland, Mich.

G. K. Eggleston, Detroit Lubricator Co., Detroit.

E. G. Jennings, Canadian Bronze Co., Ltd., Montreal, Can.

J. W. Kelin, Federated Metals Division, American Smelting & Refining Co., St. Louis, Mo.

Non-Ferrous Dinner an Enjoyable Occasion

ON Wednesday evening, May 8, the second Annual Dinner of the Non-Ferrous Division of the American Foundrymen's Association for non-ferrous foundrymen and their wives was held in the Palmer House, Chicago. Everyone who attended commented on the excellence of the program and complimented

chairman Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, and D. M. Curry, H. Kramer & Co., Chicago, who constituted the committee on arrangements, on staging such an enjoyable event.

Following the dinner, toastmaster Roast, after a few well-chosen remarks, joined the audience in singing "America." He then introduced the guests of the evening, including Louis Jordan, assistant secretary, American Institute of Mining and Metallurgical Engineers, New York, who brought greetings from that organization. Past President Marshall Post, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., spoke for the parent Association.

Interspersed throughout the program were vocal selections by Wallace Sandberg and Constance Merrell, accompanied by Jvone Lowrie, artists from the American Conservatory of Music, Chicago. Highly accomplished, the efforts of these artists were applauded roundly. All-in-all, the second annual dinner of the Non-Ferrous Division set a standard which may be hard for any future similar occasion to excel.



Awards Presentation—Past President Patch, Harry W. Dietert, F. A. Melmoth and F. K. Vial Receiving Medals.

Five Members Honored for Their Contributions to the Foundry Industry

FIVE members of the American Foundrymen's Association were honored for their contributions to the foundry industry at the Annual Business Meeting of the Association held May 8, during the Annual Convention, four of these members receiving medals, while the fifth, George Long, was elected to honorary life membership. Each medal recipient has exhibited that characteristic in his work which the various medals symbolize. Each has contributed generously of his time and effort to the benefit of the foundry industry.

Mr. Long, whose election to honorary life membership was announced in the May issue of *American Foundryman*, is a veteran foundryman, in charge of the foundry service department of Pickands Mather & Co., Chi-

cago, and is probably the only member who has attended every convention of the A.F.A. since its organization in Philadelphia in 1896. "He is 82 years young," as President Washburn stated in introducing him at the business meeting.

The four gold medals awarded are made available through funds donated to the Association by four of its pioneer officers after whom the medals are named, namely, Joseph S. Seaman, President 1899; John A. Penton, first Secretary; William H. McFadden, President 1906, and J. H. Whiting, Vice President 1906. In designing each medal, the sculptor, F. C. Hibbard, chose as his theme some one outstanding characteristic of the donor, as will be seen by an inspection of the medals which are illustrated here.

Joseph S. Seaman was noted for his kindness and helpfulness to the younger men in the industry and it is fitting that Frederick A. Melmoth, vice president and works manager, Detroit Steel Castings Co., Detroit, Mich., should be awarded recognition of his outstanding contributions to the advancement of the steel casting industry by receiving that medal. Likewise, achievement is the characteristic of the William H. McFadden Gold Medal, and certainly all will say that Harry Walter Die-

tert, Harry W. Dietert Co., Detroit, Mich., has exhibited that characteristic and deserves this award in recognition of his valuable contributions to the foundry industry through the promotion of interest in foundry sand control.



William H. McFadden Medal Presented to H. W. Dietert.

Frederick Ketchum Vial, vice president and director, Griffin Wheel Co. and Association of Manufacturers of Chilled Car Wheels, has devoted his life to improvement of the chilled car wheel. His efforts in that direction are well recognized. However, by designing and perfecting adjuncts to the cupola furnace which have increased its efficiency, he has contributed to the entire foundry industry. As in-



J. H. Whiting Medal Presented to F. K. Vial.

dustry characterizes the J. H. Whiting Gold Medal of A.F.A., it is fitting that Mr. Vial be awarded this medal in recognition of his outstanding contributions to the foundry industry

AMERICAN FOUNDRYMAN



Joseph S. Seaman Medal Presented to F. A. Melmoth.

through his developments in cupola melting.

Nathaniel K. B. Patch, secretary, Lumen Bearing Co., Buffalo, N. Y., is a past President of the Association. To be honored with the presidency of that organization, he must be a leader



John A. Penton Medal Presented to Past President Patch.

in the foundry industry and must be able to visualize the needs of the industry. Evidences of Mr. Patch's vision are many. For many years, he has been a member and an active one in A.F.A., his contributions to that and other organizations being many. He was instrumental in organiz-

ing the American Brass Founders' Association, which later became the Non-Ferrous Division of the American Institute of Mining and Metallurgical Engineers, as well as other organizations of interest to non-ferrous foundrymen. He foresaw



Design of Reverse Side of All A.F.A. Gold Medals.

the need for such organizations and the functions they might perform. Truly a man of vision, Nathaniel K. B. Patch is a worthy recipient of the John A. Penton Gold Medal of A.F.A., which signifies vision, for recognizing the needs of the foundry industry.

The Association is requesting those who wish to be identified with this division to write to the secretary of the Association and those wishing to serve on the committees of the division will be furnished with a list of the projects to be worked on from which they can make their selections.

Preview Day Crowd Sets Record

SATURDAY, May 4, was Chicago District Preview Day at the Foundry Show. Attendance at this event far exceeded the numbers attending similar events at previous Foundry Shows. Nor was the attendance restricted to the Chicago area. Many foundrymen from Wisconsin, Quad City, Michiana, Central Indiana and Detroit Chapter areas who, because of the press of business, would not have been able to attend or see the Foundry Show during the regular convention week, came to see the Preview. Throughout the entire time the Foundry Show

A. F. A. Patternmaking Division Approved

DURING the patternmaking session of the convention, a resolution was presented and passed directing a request to the Board of Directors to authorize the formation of a patternmaking division of the Association, similar in purpose to present divisions covering gray iron, malleable, steel and non-ferrous casting production. This resolution was brought up before the Board at its meeting on May 10, and President Shannon was given authority to proceed with the division's organization. He will shortly appoint a division chairman and members of an advisory committee to effect the details of the division's activities.

For several years pattern interests of the industry have been

represented by a program committee with Vaughan Reid, City Pattern Works, Detroit, as chairman. This program committee has annually developed sessions for the presentation and discussion of current pattern production problems. At the Chicago meeting this year, one of the papers presented was an extensive survey of pattern coating materials as prepared by Frank C. Cech, Cleveland Trade School, and V. J. Sedlon, Master Pattern Co., Cleveland. In 1920 the committee drew up standards for coloring of wood patterns and core boxes. Later these were approved by a joint committee under the Bureau of Standards as Commercial Standard CS19-30. These standards have been used extensively throughout the country.



President Washburn Presenting to C. E. Wilson (Right) Statuette "Baby Pegasus" at Time of Awards Meeting.

was open on Saturday, there was a constant stream of interested individuals passing the admission gate.

Admission was by special Preview Day pass. These could be obtained only through the National office, chapter secretaries, or through members of the Chicago Chapter Preview Day Committee. They were available



Old Timers Booth at Foundry Show (Above) Past President Ben Fuller and George Long Noting Service Records (Below) Old Timers Registering.



to foundry executives for distribution to their men. The latter was done to avoid duplication.

Preview Day at the 1940 Foundry and Allied Industries Show will be recorded in the history of the American Foundrymen's Association as the most successful event of its kind thus far staged and will set a new mark for future shows to excel, not only in the matter of attendance but also in interest exhibited by visitors.

Modernize Your Product with Castings

SURMOUNTED by a poster, "Modernize Your Product with Castings," one of the A.F.A. booths at the convention displayed some very interesting, complex and well finished castings. The purpose of the display was to stress the need for foundrymen to present to their engineering customers the possibilities of the use of castings in their products. This display was arranged through the courtesy of various foundry operators and manufacturers, with all

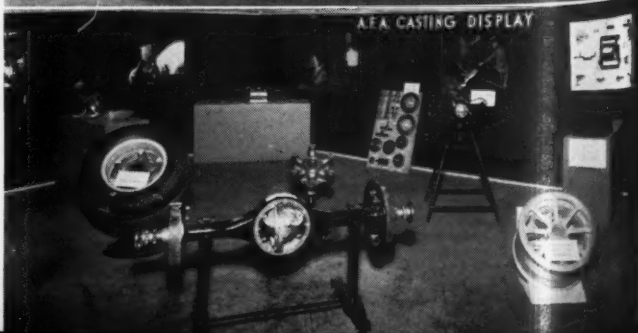
Castings on Display in A.F.A. Booth at Convention Illustrating Possibilities of Modernizing Products with Castings.

branches of the casting industry represented. One group of special significance was that showing the application of castings in the fields of transportation and communication. The accompanying illustration shows the type of castings presented.

Old Timers at Convention

ONE of the most popular places at the Foundry show was a section of the A.F.A. booth devoted to the "youngsters" in the foundry industry. With a background labelled "Is the Foundry a Safe Place to Work?" some data were displayed showing the positive answer to the question and pictures of two employes of the Campbell Wyant & Cannon Foundry Co., Muskegon, Mich., these being of Jack Cunningham, 77 years old with a record of 62 years in the foundry, and of Henry Hesby, the first employe of the company with a continuous record of 29 years. Both Mr. Cunningham and Mr. Hesby were present throughout the week. A desk in the booth was manned by a registered nurse who had charge of

(Continued on Page 23)



Annual Address of the President

By H. S. Washburn



This presidential address was presented by President Washburn before the Annual Business Meeting of the Association, held Wednesday morning, May 8, in the Ball Room of the Palmer House, Chicago, during the 44th Annual Convention of the Association.

THIS is the 44th annual convention of our Association. The American Foundrymen's Association was formed in Philadelphia in June, 1896. The first president of our Association was Mr. Francis Schumann and the first secretary, Mr. John A. Penton. Since its founding, the Association has continued to go forward.

Some time ago, as a matter of interest, I read the addresses of a number of our former presidents delivered at the annual conventions. They were forward looking men, as we must be, and if I speak in retrospect it is only to pay tribute to their interest and to their intelligent effort which has played a vital part in the advancement of our industry.

At the annual convention in Buffalo in 1901, our president, W. A. Jones, stated the Association was no longer an experiment and that its influence was felt not only in this country but its papers were eagerly sought and read by our brothers across the water. He regretted the Association was not receiving the support of a larger portion of our industry.

Eight years later, in 1909, in Cincinnati, our president, Major Anthes, stated the Association had grown to a point where it had been necessary to subdivide the members into the various branches of the casting industry. He spoke of the need for handbooks to be used by the foundryman as a practical guide in his work and emphasized the necessity of imparting accurate information. Our publications demonstrate the soundness of the Major's advice.

Molding machines had appeared and the Major spoke of the need of sand control, the better to use this new development. Dr. Moldenke was experimenting with sands from different parts of the country and was to report at that convention. We point to the work of Dr. Ries—of Prof. Davis—of Mr. Dietert—of Mr. Hanley, Mr. Harrington, Mr. Reichert and of the many others which has been of such tremendous value to every one in our

industry, and say again, "Major, your advice was sound and constructive."

At the annual convention in Detroit in 1910, President A. T. Waterfall spoke of the difficulties in earlier years in getting men with courage to tell of their experiments and their successes in producing a better class of work at lower costs and noted the willingness of many foundrymen in 1910 to give this information for the good of the industry. Mr. Waterfall, we believe, would be surprised to know the number of foundrymen in 1940 who still refrain from cooperative effort.

In Pittsburgh, in 1911, our president, Major Spear, spoke of the continued advancement in foundry practice, but bemoaned the fact that business conditions were almost as bad as in October, 1907. He stated that the changed political condition of the country indicated a complete revolution in regard to the tariff, and he feared that efforts being made in our various state legislatures would result in an amendment to the Constitution authorizing Congress to levy an income tax. If definite communication were established with the spirit world, I would be tempted to send a message saying, "Major, you didn't know the half of it."

I have referred to but two or three of these men, out of many, whose courage, whose far-sightedness and whose consideration for others in the industry have brought to us a goodly heritage. We pay tribute to those who have passed on and express our gratitude to those who still encourage us.

Our responsibility is to those who will follow us, and I present two thoughts that seem to me to be of importance to our industry.

Exchange of Ideas

The first has to do with membership. It is understandable that in the early days of our Association, a foundryman, who had developed some special method of gating or of molding a certain job, might have felt he would receive less than he would give by exchanging ideas. On the other hand, how many times have you and I gone into other foundries without taking away ideas of value to try in our own shops? The continued growth of A.F.A. affords almost unlimited opportunity for plant visitation and increasing membership enlarges the possibilities of discussing methods and exchanging ideas with others in our industry. It is hard to believe that any one foundry is so far ahead of the industry in general that it would be the loser in a broad exchange of ideas. A friend of mine who has always been interested in the foundry end of his business told me he recently called at the office of a competitor in another city and before leaving was invited to go through the foundry. He was most anxious to accept but did not feel free to do so because if this competitor called on him he would feel obliged to reciprocate

and the management of his company would allow no one in the plant. He pleaded lack of time, but his competitor was so insistent, he agreed to walk quickly through the foundry. One of the first jobs he saw was a casting that was used in large quantities by his own company and this competitor had four patterns mounted on one plate. He remarked on the fact that in his foundry they had never been able to run more than two to the mold successfully. The foreman was called over, complete detail was given regarding pattern rigging, molds produced per day and productive dollar cost. He sold the method to his own foundry superintendent and tells me it will mean savings of hundreds of dollars per year on that one casting. He is still fearful his competitor may call on him some day. He will continue his efforts to sell A.F.A. to his company.

But my thought goes far beyond the benefit or loss to the individual foundry. The tremendous developments in the recent past and in the present in engineering, in metallurgy and in new materials present a more serious challenge to our industry than it has ever faced in the past and the successful answer to this challenge cannot be found in the efforts of a few. It calls for the very best that can be brought forward by every firm and individual interested in the casting of metals. This matter of membership is not the responsibility of your officers or of a committee. It is the responsibility of every one of our members. If each of us will

accept that responsibility, I believe we will be going a long way toward meeting the challenge of today.

The Young Men in the Industry

My second thought has to do with the young men in our plants. In my opinion one of the greatest benefits we derive from our local chapter meetings and regional conferences is that it enables our younger men, foremen and apprentices, who cannot attend the annual conventions, to begin attending technical sessions and to start building a wider foundry acquaintance. In our industry more than in most others, we need the skill and the experience of the practical man who has come up through the sand pile and through the different departments of the foundry. We also need the fresh and fearless thinking of the young man whose mind is not hampered by and shackled to tradition and orthodox principles. If you in your shop and I in my shop will give encouragement and opportunity to these young men to explore and to experiment; if our men of practical experience will accept their ideas—no matter how radical they may be—with sympathetic understanding and will bring to these ideas the benefit of their own skill; if this can be extended to every foundry in the country; then if we will use A.F.A. as we have for the past 45 years as the clearing house for presenting and discussing and perfecting these ideas, I think we may face the future with confidence.

Association Elects Officers and Directors for Coming Year

AT the annual business meeting of the Association, held May 8, in connection with the annual convention in Chicago, officers and directors were elected to direct the Association for the coming year. Those elected were:

To serve one year—

President—L. N. Shannon, vice president and works manager, Stockham Pipe Fittings Co., Birmingham, Ala.

Vice President—H. S. Simpson, president, National Engineering Co., Chicago.

Directors to serve three years—

George Cannon, vice president, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich.

B. D. Claffey, manager, gray iron and aluminum division, General Malleable Corp., Waukesha, Wisconsin.

Harold J. Roast, vice president, Canadian Bronze Co., Ltd., Montreal, Que., Canada.

L. P. Robinson, director, core oil sales, Werner G. Smith Co., Cleveland, Ohio.

Henry S. Washburn, president, Plainville Casting Co., Plainville, Conn., retiring president.

Directors whose terms did not expire this year and who continue on the Board are:

H. Bornstein, director of laboratories, Deere & Co., Moline, Ill.

W. B. Coleman, president, W. B. Coleman Co., Philadelphia, Pa.

C. R. Culling, vice president, Carondelet Foundry Co., St. Louis, Mo.

W. H. Doerfner, manager, Saginaw Malleable Iron Div., General Motors Corp., Saginaw, Mich.

H. S. Hersey, president, C. O. Bartlett & Snow Co., Cleveland, Ohio.

O. A. Pfaff, vice president, American Foundry Equipment Co., Mishawaka, Ind.

Marshall Post, vice president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

G. A. Seyler, works manager, Lunkenheimer Co., Cincinnati, Ohio.

A. Walcher, vice president, American Steel Foundries, Chicago, Ill.

Fred J. Walls, metallurgical engineer, International Nickel Co., Detroit, Mich.

A short biographical sketch of the career of each of the newly elected officers and directors follows:

AMERICAN FOUNDRYMAN

Sketches of Officers and Directors Elected at Chicago

LESTER N. SHANNON, vice president and works manager, Stockham Pipe Fittings Co., Birmingham, Ala., elected President of the American Foundrymen's Association, is well acquainted with the work of the Association, having served as a director and vice president, and as the first chairman of the Birmingham District Chapter of A.F.A.



L. N. Shannon

Born in Carbon Hill, Ala., Mr. Shannon received his early education in the public schools there and later attended Birmingham Southern College from which he was graduated with a B.S. degree. Following graduation, he immediately became associated with the company in whose service he has risen to his present position.

HERBERT S. SIMPSON, elected vice president of the Association, is president, National Engineering Co., Chicago. He has been associated with the foundry and foundry equipment industry for many years, both through his own efforts and the experience of his father, Peter L. Simpson, who, before his death in 1917, had spent his life in the foundry and machinery business.

Mr. Simpson was born in Minneapolis and moved to Chicago when a young boy. After finishing his education, he engaged in the manufacture of clay working machinery, later becoming

assistant to the president of the Hatfield-Penfield Steel Co., Bucyrus, Ohio. In 1917, he left that company to associate himself with the National Engineering Co., Chicago, manufacturers of sand mixing and conditioning and other foundry equipment, of which organization he has been president since its incorporation.

Mr. Simpson is a past director of the American Foundrymen's



H. S. Simpson

Association and a past president of the Foundry Equipment Manufacturers' Association. For many years he has supported the various research activities of the A.F.A. and has been very active in the Association in many ways. He is also a past president of the Kiwanis Club of Chicago; a former alderman in the City of Evanston, Illinois, acting as chairman of the Finance Committee of that body from 1931 to 1934. He is at this time a trustee of the Evanston Library Board.

GEORGE W. CANNON, vice president, Campbell Wyant & Cannon Foundry Co., Muskegon, Mich., elected a director of the Association, is one of three iron molders who together created the world's largest jobbing foundry, consisting of two plants located at Muskegon and a third at South Haven, Mich. Like the other principal officers of the business, he has served as vice president since its organization in 1908.

With native Irish amiability, Mr. Cannon has devoted himself to the business relations of the company which has supplied motor blocks for nearly every automobile company and leading manufacturers of trucks, tractors and agricultural equipment.

He is a native of Springfield, Ill. As a young man, he drifted to Chicago and took a job in an iron



G. W. Cannon

works. Through mutual friends he won the acquaintance of two men, now associated with him in the Campbell Wyant & Cannon Foundry Co., Donald J. Campbell, president, and Ira A. Wyant, secretary-treasurer. They first met in 1905 and in that year set up an iron works in Chicago.

The trio were eager to put into operation ideas they developed for the improvement of the foundry business and, needing capital, they accepted an offer from the Chamber of Commerce of Muskegon, then seeking new industries, to take the place of vanished sawmills, giving them a building and a small stake with which to expand.

At that same period, another new industry began in Muskegon, the Continental Motors Corp., and the trio obtained their first order from Continental. That started the Campbell Wyant & Cannon Foundry Company on a spectacular period of growth. In the first year, they

increased their force to 25 men, and today their operations, when at the peak, require 3,400 workers.

Mr. Cannon is intensely interested in the advancement of the industry from the standpoint of metallurgy and the furtherance of hygiene, safety and good housekeeping as the basis of the production of superior products and efficient management and still personally supervises aggressive pioneering in both of these fields.

B. D. CLAFFEY, elected a director of the Association, is manager, gray iron and aluminum divisions, General Malleable Corp., Waukesha, Wis. Mr. Claffey has served as secretary and vice president of the Wisconsin Chapter of the A.F.A. and has been elected to serve as chairman of the Wisconsin Chapter for the coming year. He served as chairman of the Wisconsin Chapter committee which staged the 1940 or Third Annual Foundry Conference held jointly with the University of Wisconsin.

Mr. Claffey started his foundry work in 1915 as a laborer and



B. D. Claffey

later as core maker and molder with the Spring City Foundry Co., Waukesha, remaining with the company until 1928, when he became foundry adviser with the Wisconsin Motor Co., Milwaukee. In 1923, he accepted a position as works manager, Milwaukee Gray Iron Foundry Co., a position held until 1933, at which

time he organized the Claffey Casting Company of which he was president and general manager. In 1936, the Claffey Casting Company was merged with the General Malleable Corporation, with Mr. Claffey being manager of the gray iron and aluminum division.

In addition to his membership in the A.F.A., Mr. Claffey is a member of the Society of Automotive Engineers and the Gray Iron Founders' Society.

HAROLD J. ROAST, elected a director of the Association, is vice president in charge of technical operations, Canadian Bronze Co., Ltd., and its subsidiaries, and owner of Roast Laboratories, Montreal, Que., Canada. Mr. Roast was born in London, England, and received his formal education at the Henry VIII Foundation, Berkhamstead, and at the City of London College, of which he is a graduate. He came to Canada in 1902 to accept a position as chemist with the Milton Hersey Co., Montreal. Later industrial connections have been—chemist in charge, Canada Iron Foundries, Radnor Forges, Province of Quebec, 1903; associated with Dr. J. T. Donald and also works manager, Canadian Carbonate Co., Ltd., Montreal, 1904; general manager, Canadian Magnesite Co., Montreal, and Newark, N. J., 1907; manager, testing dept., the James Robertson Co., Ltd., Montreal, 1914; vice president and general manager, National Bronze Co., Ltd., Montreal, 1922, and president in 1926; disposed of National Bronze Co., Ltd., to the Robert Mitchell Co., Ltd., 1928, and was retained by the successor company as metallurgical director, 1928-33; became associated with Canadian Bronze Co., Ltd., as technical advisor, 1933-35; 18 years sessional lecturer, McGill University, Dept. of Metallurgy, 1918-36.

During the European war, Mr. Roast acted as metallurgist in charge of shell production. In his technical association connections, he represented Canada for

several years on the Board of the American Institute of Metals, before its absorption by the A.I.M.E.; vice chairman, Canadian Section, American Foundrymen's Association; chairman, Non-Ferrous Division, American Foundrymen's Association;



Harold J. Roast

was largely instrumental in the organization of the Canadian Institute of Chemistry and of the Association of Professional Chemists, P.Q.

Mr. Roast is Fellow, Chemical Society of London, England; Fellow, Canadian Institute of Chemistry; Member, Engineering Institute of Canada; Fellow, Sigma Xi Society, McGill Chapter; Member, American Society for Testing Materials, and other organizations.

He has been a voluminous contributor to scientific journals on technical subjects and to the public press on matters of general interest such as "Montreal as One of the Important Centres for Inter-Empire Trade," 1932; "A General Outlook of the Canadian Metal Industry," 1932.

Among his important scientific papers are the following: "Production and Use of Lead in Canada," Montreal Metallurgical Society, 1916; "Notes on Shrapnel Bullets," Journal of the American Institute of Metals, 1917; "Inner Life and Activity of Metals," before the Chemical Association, McGill University,

AMERICAN FOUNDRYMAN

1919; "Arsenical Bearing Metals," Roast and Pascoe, A.I.M.E., New York, 1922; "Bearing Metal Bronzes," Roast-Newell, E.I.C., 1926; "A Practical Foundry Test on the Effect of Phosphorus, Aluminum and Silicon on Leaded Bronze," American Foundrymen's Association, June, 1933; "Problems in Bronze," American Society of Metals, 1934; "Chemistry in Its Relation to Fire," Insurance Institute of Montreal, 1935; "The Engineer and Non-Ferrous Alloys," before Engineering Institute of Canada, 1937; "Honesty in the Foundry Business," American Foundrymen's Association, Philadelphia, 1938.

LEROY P. ROBINSON, elected a director of the Association, is director of core oil sales for the Werner G. Smith Co., Cleveland, Ohio. Mr. Robinson, who has been actively interested in the work of the Association, is a past chairman of the Northwestern Ohio Chapter and has appeared before practically all the chapters and foundry groups of the country discussing foundry core room practices.

One of the best known men connected with the foundry industry, Mr. Robinson has had an interesting and colorful career. Born at Burlington, Iowa, his family later moved to Mt. Pleasant, Iowa, where he was graduated from high school in 1901. He then attended Lombard College, Galesburg, Ill., from 1902 to 1906, taking a liberal arts course.

For the next two years young Robinson served as freight brakeman for the C. B. & Q. R. R. at Galesburg. Then, for two years, he was in sales promotional work with the Florida Everglades Land and Sales Company which he says was just twenty years too soon to take advantage of the Florida real estate boom. From 1910 to 1914 inclusive, Mr. Robinson proved that he had talent as an actor, appearing on the stage.

In 1915, Mr. Robinson returned to the sales field with the Ojib-



L. P. Robinson

way Realty Co., Detroit. In 1917, he first became connected with a firm which dealt with foundries, when he was made New England manager of the Werner G. Smith Co., which position he held until 1928. For some eight years of this period he was also a representative of the Sterling Wheelbarrow Co. Because of his outstanding sales ability, he was, in 1929, called to Cleveland to head the core oil sales of the Werner G. Smith Co., his present position.

HENRY S. WASHBURN, having served as a director, vice president and, for the past year, as president of the American Foundrymen's Association, was elected a director of the Association. Mr. Washburn, president, Plainville Casting Co., Plainville, Conn., and Vermont Foundries, Inc., Springfield, Vt., was born in Brooklyn, N. Y., and received his early education at St. Paul's School, Garden City, N. Y., later attending Yale University.

Mr. Washburn's first commercial position was as bookkeeper with the Corn Exchange Bank of New York. From 1906 to 1917 he held various positions as clerk, credit man, and office manager with the D. L. & W. R. R., H. B. Claflin Co., and Butler Bros. of New York City. From 1917 to 1921, Mr. Washburn was purchasing agent, Turner & Seymour, Torrington, Conn. Since 1921, he has been president and

treasurer of the Plainville Casting Co., Plainville, Conn.

Mr. Washburn has been greatly interested in foundry technical association work, is a member of the American Foundrymen's Association, the Connecticut Foundrymen's Association, National Founders' Society and the Gray Iron Founders' Society.

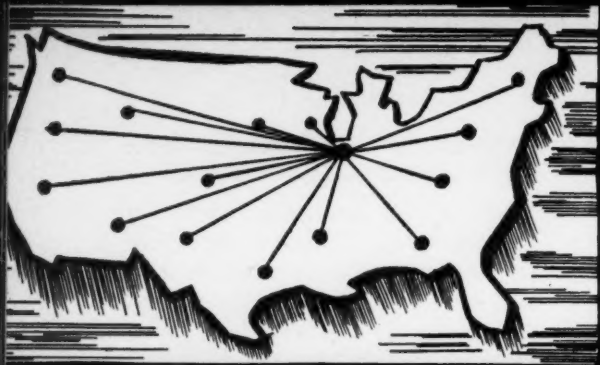
J. J. Sheehan Submits British Exchange Paper

THE annual exchange paper of the Institute of British Foundrymen as presented before the 1940 Chicago A.F.A. meeting was prepared by John Joseph Sheehan of Birmingham, England. Mr. Sheehan, who took as his subject for this paper "Sand Control in British Foundries," is at present foundry superintendent of the Austin Motor Co. He is a pioneer of synthetic sand practice in England and has written some papers on that subject, notably, "Recent Developments in British Synthetic Sand Practice," given at the Annual Conference of the Institute of British Foundrymen in Manchester in 1934, and a paper on "Core Shop Control," given at the International Foundry Congress held in London in 1939.



J. J. Sheehan

Mr. Sheehan received his metallurgical training at the Royal College of Science, Ireland, and is an Associate of that College and also a Bachelor of Science at the National University, Ireland. He worked for some time in America, mainly in the mining regions of the Rocky Mountains, and with the Ford Motor Co., Detroit, also with the Ford Motor Co. in Cork, Ireland, and Dagenham, England, before accepting his present position with the Austin Motor Co.



Chapter Activities

Central New York Meets at Cornell University

By L. D. Wright*, Geneva, New York

A RECORD attendance of 125 members and guests was present at the April 19 meeting of the Central New York Chapter which was held in Willard Straight Hall, Cornell University, Ithaca. Those attending heard H. W. Dietert, Harry W. Dietert Co., Detroit, talk on "The Effect of Molding Sand on the Physical and Mechanical Properties of Castings," while chapter chairman H. H. Judson, Goulds Pumps, Inc., Seneca Falls, presided.

Prof. W. N. Barnard, director of the Department of Mechanical Engineering, Sibley College of Engineering, Cornell University, welcomed the visiting foundrymen to the University and expressed the interest of the University staff in the work that the members of the American Foundrymen's Association were carrying on.

Chairman Judson introduced Dr. Ries and Prof. Wells of the University and stated that these two men and the speaker of the evening, Mr. Dietert, were in a large measure responsible for the original sand testing equipment. The Central New York Chapter felt very honored by having these three men together at their meeting.

The report of the nominating committee was presented by G. M. Thrasher, R. Lavin & Sons, Inc., Elmira, naming the following for election at the May meeting: *Chairman*, Frank Wheeler, Kimman & Wheeler, Syracuse; *Vice Chairman*, E. J. Bair, Sr., Utica

Radiator Corp., Utica; *Secretary*, L. D. Wright, U. S. Radiator Corp., Geneva; *Treasurer*, Harold Boardman, Elmira Foundry Co., Elmira; *Director* for two years (to fill unexpired term of Mr. Boardman), Leo P. Fedigan, International Harvester Co., Auburn; and *Directors* for three years—H. H. Judson, Goulds Pumps, Inc., Seneca Falls; A. C. Davis, Cornell University, Ithaca; and Curtis M. Fletcher, Fairbanks Co., Binghamton.

Chairman Judson then presented Mr. Dietert as the speaker of the evening. Mr. Dietert stressed the great influence that the moisture content of a molding sand has on the physical and mechanical properties of cast metal. The moisture materially increases the chill and fluidity of the metal is reduced as the moisture content of the sand increases. An increase of moisture

also reduces the deflection or ductility of a metal with a marked influence on the strength of the metal.

In referring to the permeability of the sand, the attention of the foundrymen was directed to the increase in the rate of heat transfer as the permeability increased and this in turn affects the chill depth and porosity of the metal in the casting. It was also pointed out that the permeability of the sand influences the fluidity of the metal.

Mr. Dietert used lantern slides to illustrate his talk, which was very well received by the foundrymen present. At the conclusion of Mr. Dietert's talk, the usual question and answer period followed. This period has come to be an accepted part of each meeting and it is apparent that the foundrymen present are taking full advantage of the educational opportunities afforded them during this period. The meeting extended well beyond the usual time limit due to the number of questions presented to Mr. Dietert by the foundrymen.

Michiana Hears Pat Dwyer

By M. F. Surls*, Buchanan, Mich.

THAT popular and well-known speaker, Pat Dwyer, engineering editor, THE FOUNDRY, Cleveland, was the lead-off speaker of the April 9 meeting of the Michiana Chapter. Held at the Oliver Hotel, South Bend, 125 members and guests were present with chapter chairman A. C. Arbogast, Northern Indiana Brass Works, Elkhart, presiding. Pat, as he is affectionately known to his host of

foundry friends, started the meeting with an interesting talk on his experiences.

The members then divided into three groups for round table meetings. E. C. Bumke, Oliver Farm Equipment Co., presided at the steel and malleable discussions, with the discussion leader being J. H. Lansing, Malleable Founders' Society, Cleveland. M. A. Scott, Greenlee Foundry Co., Chicago, was the discussion leader for the gray iron group, while W. A. Bach-

*U. S. Radiator Corp. and Secretary, Central New York Chapter.

*Clark Equipment Co. and Reporter for Michiana Chapter.

man, New York Central Railroad, Elkhart, presided. The chairman of the non-ferrous group meeting was Mr. Arbogast, with W. B. George, R. Lavin & Sons, Chicago, as discussion leader. The round table meetings proved very popular with much interesting discussion on current problems.

The election of officers for the coming year was held at this meeting, and the following were elected: *Chairman*, M. F. Doty,

Clark Equipment Co., Buchanan, Mich.; *Vice Chairman*, E. C. Bumke, Oliver Farm Equipment Co., South Bend, Ind.; *Secretary-Treasurer*, L. L. Andrus, American Foundry Equipment Co., Mishawaka, Ind.; and *Directors*—R. E. Patterson, Elkhart Foundry & Machine Co., Elkhart; J. E. Drain, Oliver Farm Equipment Co., South Bend; S. W. Howard, Neil-McLain Co., Michigan City; F. T. McGuire, Notre Dame University, Notre Dame.

Dost Discusses Machine Tool Castings Before New York-New Jersey Chapter

By K. A. De Longe*, New York, N. Y.

"THE progress of the machine tool castings industry in the last 10 years has been greater than that of the preceding 20 years," declared Frank Dost, Sterling Foundry Co., Wellington, Ohio, in his talk before the Metropolitan New York-New Jersey Chapter of the A.F.A. at the April 29, 1940, meeting held at the Essex House, Newark, N. J. Introduced to an audience of about 55 members and guests by technical chairman J. S. Vanick, International Nickel Co., Mr. Dost gave a resume of the machine tool casting field and described the trend within the last 10 years from the high carbon type of gray iron to the low carbon compositions which are today in common use. For the most part, he indicated, this progress is attributable to the greater strength and higher hardness developed by the lower carbon irons.

During the years that the high carbon machine tool castings held sway trouble was constantly encountered in securing uniform properties in the sections involved, which varied from $\frac{3}{8}$ to 4 inches. The use of alloys helped to reduce the variation. With the increasing demand for greater uniformity, finish and wear resistance, the machine tool foundries resorted to lower carbon irons. Castings of this

type containing from 2.7 to 3.0 per cent total carbon were found to be less sensitive to sectional variation, one mixture serving where two or three were required for the formerly used high carbon iron.

With the advent of higher strength machine tool castings came an enigma in the form of the scoring and galling of wearing surfaces. Immediately there began a search for the cause of the new trouble. An extended investigation ultimately comprising some ten thousand chemical determinations and four thousand micro inspections established the fact that the presence of a dendritic type graphite structure and associated free ferrite was responsible for the poor wearing characteristics.

Low carbon contents and the use of melting temperatures of 2850°F. and over were found to be responsible in a large part for producing the undesirable structure.

Subsequent experiments following this discovery demonstrated that graphitizing ladle additions served to maintain a normal graphite structure and a fully pearlitic matrix and resulted in an iron possessing excellent resistance to scoring and galling. Following in line with this procedure the silicon content of the base metal was reduced and the practice of adding silicon to the ladle was established in daily production. This practice resulted in adequate control of the metal structure to insure that wearing surfaces on machine tool castings will be of the desired quality. The discussion following Mr. Dost's talk gave evidence of the keen interest in the subject of wear resistance.

During the business meeting preceding the technical session the following slate of officers was elected for the coming year: R. J. Allen, Worthington Pump and Machinery Co., Harrison, N. J., *chairman*; J. W. Reid, Robins Conveying Belt Co., Passaic, N. J., *vice chairman*; W. A. Phair, Iron Age, *secretary*, and R. E. Nesbitt, Pratt Institute, Brooklyn, N. Y., *treasurer*. Earlier in the evening a sound film, "Flagships of the Air," was shown through the courtesy of the American Airlines, Inc.

Ontario Chapter is Told the Story of Pig Iron

By G. L. White*, Toronto, Ont.

THE April-meeting of the Ontario Chapter at the Rock Garden Lodge, near Hamilton, found over one hundred in attendance to hear incoming Chapter Vice Chairman N. B. Clarke, Steel Co. of Canada, Ltd., Hamilton, give an illustrated lecture on the manufacture of pig iron,

and to enjoy that fine fellowship that grows with every meeting as members become better acquainted.

Most important business item of this meeting was the election of officers for 1940-1941, as follows: *Chairman*, D. M. Storie, Fittings, Ltd., Oshawa; *Vice Chairman*, N. B. Clarke, Steel Co. of Canada, Ltd., Hamilton;

*International Nickel Company and Technical Secretary, New York-New Jersey Chapter.

*Editorial Dept., Canadian Metals and Metallurgical Industries, and Reporter Ontario Chapter.

Sec.-Treasurer, S. R. Francis, Metals and Alloys, Ltd., Toronto; *Asst. Sec.*, R. Banks, Metals and Alloys, Ltd., Toronto; *Directors* — One year terms: O. W. Ellis, Ontario Research Foundation, Toronto; W. R. Barnes, W. R. Barnes, Ltd., Hamilton; J. J. McFadyen, Galt Malleable Iron Co., Ltd., Galt. Two year terms: J. Thwaites, Beatty Brothers, Ltd., Fergus; J. Reid, Canadian Westinghouse Co., Ltd., Hamilton; C. C. MacDonald, F. B. Stevens Co., Ltd., Toronto. Three year terms: J. C. Stavert, Babcock - Wilcox & Goldie-McCulloch, Ltd., Galt; N. C. McPhee, McKinnon Industries, Ltd., St. Catharines; T. A. Rice, International Harvester Co. of Canada, Ltd., Hamilton.

Secretary - Treasurer S. R. Francis was given a big hand for his past year's work and for his willingness to carry the burden for another year; and retiring Chairman D. J. MacDonald received recognition for the important part that he played in the successful season enjoyed by the Ontario Chapter.

Describing the production of pig iron, N. B. Clarke pointed out that blast furnace is, along with the cupola, still the most efficient of metallurgical processes, and it has not been found economically sound to convert iron ore directly into steel. Iron is present in iron ore in the form of iron oxide to the extent of about 50 per cent, along with

Wisconsin Chapter Hears W. J. Cameron (Above) Chapter President MacNeill (Left) and Chapter Vice President Claffey (Right) Chatting with Mr. Cameron. (Below) Ladies of the Chapter Invited to Hear Mr. Cameron's Address.

Photo—Courtesy John Bing, A. P. Green Firebrick Co.

magnesia, etc. The problem of the blast furnace is to remove the oxygen from the iron oxide while taking care of the earthly impurities or gangue. Coke and heat are the media for reduction of the iron oxide and limestone is utilized to unite with the silica and alumina to form a fluid slag which can be separated from the iron.

Early developments in the treatment of iron ores resulted in the production of wrought irons in the form of pasty masses which were freed from slag by hammering. It was not until about 1350 that molten pig iron was produced. The Germans found that with an excess of charcoal, greater heat and other favorable conditions, the wrought iron could be made to absorb sufficient carbon to make it easily fusible, and capable of pouring into moulds to be cast into any desired shape.

A typical modern blast furnace is roughly 90 feet high and 20 feet in diameter, has a volume of 20,000 cubic feet and a 36-inch lining of first quality fireclay such materials as silica, alumina,

brick. Charging of the furnace without loss of gas from the top is effected by the use of two charging bells. The hot gases from the furnace preheat the air being blown to the tuyeres and then are utilized for their fuel value in various parts of the plant. The fuel value of the gases depends largely upon their content of carbon monoxide left after this gas has performed its duty as a reducing agent converting the iron oxide into iron.

Molten iron is tapped out through the iron notch which is at the bottom of the brick lining of the furnace. General practice is to tap a furnace about every four hours but since there is not enough room between the iron level and the tuyeres to hold all the iron and slag, about one-half the slag must be drawn off through the cinder notch between casts. Running full blast an average furnace will require in twenty-four hours about 1,200 to 1,300 tons of ore, 500 to 600 tons of coke, 300 to 350 tons of limestone, and 2,200 tons of air to make 700 tons of iron, 300 tons of slag and 3,000 tons of gas.

Cameron of Ford Company Addresses Wisconsin Chapter

By A. C. Ziebell*, Oshkosh, Wis.

THE largest group of the year attended a regular meeting of the Wisconsin Chapter on April 19 to hear W. J. Cameron, Ford Motor Car Co., Detroit, speak on "Outlook for American Business." W. J. MacNeill, Federal Malleable Co. and chapter president, presided at the dinner at which ladies of the chapter members were present to make up the 300 in attendance. Al Buettner and Joe Wesley furnished the musical entertainment of the evening. The results of the election of new officers for the coming year were announced, naming as *President*, B. D. Claffey, General Malleable Corp.; *Vice President*, A. C. Ziebell, Universal Foundry Co.; *Secre-*

tary, Howard Waldron, Nordberg Mfg. Co.; *Treasurer*, R. F. Jordan, Sterling Wheelbarrow Co.; and *Directors*, D. C. Zuege, Sivyer Steel Casting Co., and Fred Pritzlaff, Falk Corp.

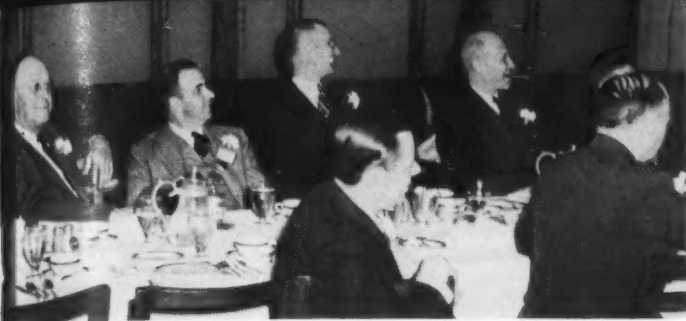
Mr. Cameron was then introduced and made one of his well-known and thoroughly appreciated addresses. He stressed the following points:

The purpose of men in business was to increase the wealth of the nation and two major objectives of business men are—
(1) To make our own living,
(2) To assist others in making a living. The majority of manufacturers are making things to make a living with, such as autos, tractors, etc. Business is made up of a net-work of small businesses, and the small businesses

AMERICAN FOUNDRYMAN



*President, Universal Foundry Co., and Secretary, Wisconsin Chapter.



Photo—Courtesy E. F. Wiechmann, Whiting Corp.

Chapter Officers Hold Convention Breakfast (Left to Right—Rear) Bowring of Detroit, Wagner and Thompson of Central Indiana, Lincoln of Northeastern Ohio (Front) Armstrong of Buffalo and Landstrom of Northern Illinois-Southern Wisconsin.

do the bulk of the business. In the automotive industry, making parts for large companies are ten thousand companies that many have never heard of but whose work is essential before the large companies can start operating.

Mr. Cameron stated that business men are largely made up of farmer boys who sold papers, boys who worked up from the bottom. He stressed the fact that

while this country is 20 billions behind what it should be, these leaders are now beginning to recognize that it is their problem and showed real progress in 1939. Mr. Cameron continued his address by showing what can be done to bring out the full benefits of the possibilities of resources of this country in men and materials and by defeating adverse trends.

Southern California Elects Officers and Discusses Gray Iron Production

By W. F. Haggman*, Los Angeles, Calif.

THE April meeting of the Southern California Chapter was held at the Clark Hotel, Los Angeles, on the 24th, with chapter chairman A. G. Zima presiding, when some 90 members sat down to dine together. A coffee talk was given by Mr. Wasson of the U. S. Secret Service on "Know Your Money," illustrated with a movie.

Nominations for officers and directors were presented as follows: *Chairman*, James E. Epley, Kinney Iron Works; *Vice Chairman*, Glenn Merrefield, Warman Steel Castings Co.; *Secretary*, W. F. Haggman, Foundry Specialties Co.; *Treasurer*, Earl Anderson, Enterprise Foundry Co.; and *Directors* to serve for two years—B. G. Emmett, Los Angeles Steel Castings Co.; James O'Hara, Fraters Valve & Fittings Co.; A. M. Barker, Barker Foundry Supply Co.; H. E. McGowen, H. E. McGowen Co.

The technical talk was presented by R. E. Brown, Electro Metallurgical Sales Corp., who

spoke on "Evaluation of Deoxidizing and Graphitizing Alloys in Gray Iron Production." Mr. Brown advised the members of some of the facts that have been determined concerning the addition of alloys to cast iron for its wall sensitivity and its strength and other physical properties. It was explained that though we have a comprehensive understanding of base mixtures, cupola operations and proper employment of additions of chromium nickel, molybdenum, vanadium and other special alloys that there have remained at least until recently considerable difficulties in the founding of iron, the most complex of which is probably that concerning the sensitivity in wall thickness of

cross section. He stated that it was now feasible to deal very successfully with this problem and that single castings containing both heavy and light sections could be produced with sound, strong sections that possessed also completely readily machinable light sections. The procedure involves usage of methods of ladle deoxidization and graphitization employing scientifically balanced alloys of silicon with other elements. The method differs from older cupola iron melting and practice in that a substantial reduction in silicon—0.50 per cent to 1.00 per cent or even more—in the base iron below that finally desired is required. So a relatively large addition of silicon is made in the ladle in the form of silicon deoxidizing and graphitizing alloy. The speaker identified a number of silicon alloy combinations available and suitable for use in this practice and through an explanation of the metallurgy involved evaluated the comparative efficiency of the compositions in most general use.

Bales Talks on Refractories at Freeport

By H. C. Winte*, Beloit, Wis.

ON April 16, the Northern Illinois-Southern Wisconsin Chapter held its regular monthly meeting at the Hotel Freeport, Freeport, Ill., with 45 members and guests attending. G. J. Landstrom, chapter chairman, presided, while C. E. Bales, Ironton Fire Brick Co., Ironton, O., and a member of the A.F.A. Refractories Committee, spoke on "Foundry Refractories." The

*Fairbanks Morse & Co. and Technical Secretary, Northern Illinois-Southern Wisconsin Chapter.

Chapter Officers at Convention Breakfast (Left to Right) Simpson and Phillips of Chicago, McMahon and Bowers of Birmingham, E. O. Jones, Chicago A.F.A. Office, Lesser of Quad City, Kelin of St. Louis and Coleman of Philadelphia.



Photo—Courtesy E. F. Wiechmann, Whiting Corp.

*Foundry Specialties Co. and Secretary, Southern California Chapter.

JUNE, 1940

manufacture of refractories was described. The discussion covered the mining of the clays, the type of clay used, the blending of the clays, and the molding of the refractories. The present product was compared with the old and it was shown why the new methods make a better refractory. Improvements for lining ladles were discussed. The discussion covered methods for slag skimming and new type of

linings. The use of materials for rammed linings was shown because where Purite is used to treat the iron they have shown a resistance to the action of the Purite on the lining. The air furnace refractory problem was discussed and the improvements effected were presented. Air furnace bottom brick vs. the sand bottom was discussed. The meeting was followed by a discussion.

Chicago Chapter Holds Annual Meeting

AFTER playing host to the foundrymen of America attending the 44th Annual A.F.A. Convention, the Chicago chapter held one of its most interesting and entertaining meetings on May 13 at the Chicago Towers Club, with chairman C. E. Westover, Burnside Steel Foundry Co., presiding. Following the dinner, chairman Westover requested C. E. Hoyt, Executive Vice President, to give a short resume of the convention activities. Mr. Hoyt, speaking in behalf of the Association and the Board of Directors, thanked the chapter for its cooperation in making the convention an overwhelming success. He expressed his sincere gratitude for the fine workmanship carried out by all the members and committeemen who worked so diligently on all the convention committees.

After the report of Mr. Hoyt, past chairman Westover read to all the members present the names of the newly elected chapter officers and directors for the coming year as follows: *Chairman*, G. P. Phillips, International Harvester Co.; *vice chairman*, L. L. Henkel, Interlake Iron Corp.; *secretary*, B. L. Simpson, National Engineering Co.; *treasurer*, C. C. Kawin, C. C. Kawin Co. *Directors*: C. E. Westover, Burnside Steel Foundry Co.; T. J. Magnuson, J. S. McCormick Co.; H. A. Forsberg, Continental Roll & Steel Foundry Co.; and Martin Lefler, Western Foundry Co.

The meeting was then turned over to new vice chairman L. L. Henkel. Mr. Henkel introduced

past chairman L. H. Rudesill, Griffin Wheel Co., who in a short speech complimented the past chairman for guiding the organization through an exceptional year; citing the successes of the national convention and the Chicago Regional Conference. He then presented to Mr. Westover a trophy that is awarded annually to all outgoing chairmen.

Movies of the September Chicago outing, taken at Lincolnshire Country Club, were then shown for the members and guests.

As a fitting climax for the last meeting of the year Mr. Henkel introduced L. P. "Robbie" Robinson, Werner G. Smith Co., Cleveland. "Robbie" then proceeded to turn a foundrymen's meeting into a poultry forum by talking about his chicken farm. In the humorous manner that can only be told in the "Robbie Manner," he explained to his audience how he obtained his farm, his decision to raise chickens, how his business led him to become acquainted with animal husbandry, cost accounting, heating and ventilation, etc. Anent his plight as a coreoil-farmer the speaker told of many interesting events that made those present laugh heartily at his story telling qualities.

Kuniansky Talks at Birmingham

By Farrar Hill*, Birmingham, Ala.

THE Birmingham District Chapter was especially fortunate in securing Max Kuniansky, Lynchburg Foundry Co., Lynchburg, Va., as the technical speaker for its April 19 meeting. This was held at the Tutwiler Hotel, with chapter chairman W. O. McMahon, Sloss-Sheffield Steel & Iron Co., presiding and 100 members present. Mr. Kuniansky gave a most interesting talk on "Modern Foundry Practice." In connection with his talk, he showed a few slides of the different types of castings made in the plants of the Lynchburg Foundry Co. He also explained the methods as to how these castings were made which lead to a very active discussion. Mr. Kuniansky was introduced by H. J. Noble, American Cast Iron Pipe Co., Birmingham.

*Hill & Griffith Co. and Reporter for Birmingham District Chapter.

Northern California Holds Meeting on Ceramics

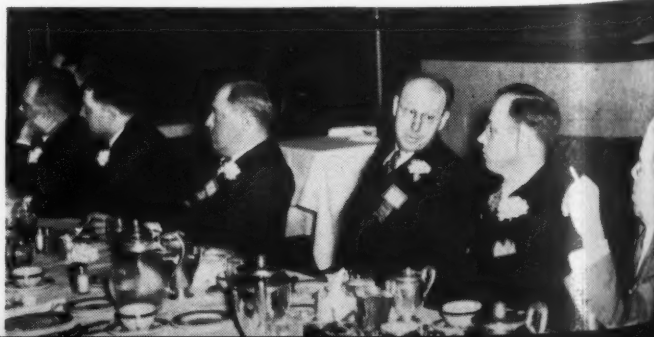
By G. L. Kennard*, San Francisco, California

MAY 10 was the date of a regular meeting of the Northern California Chapter and while some of the members were east attending the annual convention in Chicago, about 40 were present at the Alexander Hamilton Hotel, San Francisco. With Sam Russell, chapter chairman, presiding, A. T. Roth, Morrison Company of San Francisco, provided a coffee talk feature of two reels of colored film on deep

(Continued on Page 23)

*Secretary-Treasurer, Northern California Chapter.

Chapter Officers at Convention Breakfast (Left to Right) Lesser of Quad City, Kelin of St. Louis, Coleman of Philadelphia, Judson of Central New York, Dietert of Detroit and Armstrong of Buffalo.



Photo—Courtesy E. F. Wiechmann, Whiting Corp.

Research and Developments in Cast Metals[†]

(First Section)

C. H. Lorig,* Columbus, O.

A REVIEW of all the recent developments and researches in cast metals would of necessity limit this paper to little more than a listing of topics. It therefore seems preferable to select a relatively few of the more interesting items and treat these in slightly greater detail.

The technical developments in the casting industry in the past few years are varied and many. Engineering progress in the construction of improved and more modern foundries having better lighting and streamlined for high productivity, or as typified by the refinements in the molding equipment, the furnaces, and in sand handling, and even the adoption of new forms of fuel for melting, as was the case in the malleable industry which has been converted almost exclusively to pulverized coal firing in relatively few years, are achievements whose value to the industry as a whole is enormous. However, we shall pass them by and confine the paper chiefly to metallurgical developments, and even then drastically limit our selection.

Research has contributed little to the casting industry, measured on the scale of what is to come; yet much of the development in the past that has raised the industry to its present level has been the product of diverse researches, both of fundamental and practical natures. Engineering which is applied science and metallurgy, which is mainly the application of the chemical and physical branches of science, are completely dependent on research for their progress. If neither progresses then industry does not progress. Hence those that are in the casting industry have a vital interest in research and developments as they affect the trends in their business.

New developments in the casting industry have come fast and will continue to come at an ever increasing rate. Why? Because of the ever increasing amount of energy and thought given to the matter. This snowballing of events comes from the efforts of our colleges and engineering stations to train men and to conduct research; from the contributions of suppliers of materials, a source of information that has had an astounding growth in the last ten

years; to individuals in the industry; and to the work of individual laboratories and institutions.

Developments in Cast Iron Alloying and Carbon Control.

The introduction of alloying elements in cast iron has been responsible for some of the most outstanding developments in cast iron metallurgy in our times. While alloying of gray iron dates back twenty-five years the use of alloys has started a train of events that have had an astonishing influence on the gray iron industry as a whole. It has made the industry high-strength conscious, with the result there has been a sound growth in the manufacture and use of irons whose strength far exceeds what previously had been the rule for gray iron. The natural effect was to extend the field of application for cast iron, to develop irons better adapted to given requirements, to utilize more effectively those inherent characteristics possessed by cast iron, such as wear resistance, damping capacity,

considerably. Along with this there has been a general movement toward making better irons without alloying. Through the control of carbon and silicon content mainly and with a growing appreciation of the influence of structure on the properties of irons, unalloyed irons are now being made consistently, in some foundries, with strengths well over 40,000 lb. per sq. in. That is a remarkable achievement. It is something, however, every gray iron foundry will soon be able to accomplish as a routine matter.

Lowering of the carbon by using higher steel charges in the cupola, or by better regulation of the cupola, giving lower carbon irons, have been two of the most successful means for raising the strength of the irons. These practices have led to others which primarily concern a better control of graphite size and distribution. Thus there is the general tendency to raise the temperature of the metal from the cupola and, further, to make ladle additions of ferrosilicon, calcium silicide, and various other graphitizers.

Superheating of Cast Iron

Superheating of cast iron, as it is often called, came about with the advent of electric furnace melting. By raising the temperature, which was easily accomplished in the electric furnace, a refinement in graphite size in the iron was obtained. This refinement in the graphite, coupled with a more ideal distribution, improved the strength of gray iron without changing its composition. The discovery that irons could be strengthened by superheating has had a significant influence on melting operations today. Now, the results of superheating are not always as we would like to have them; sometimes they are bad. In Fig. 1 are shown the properties of the two high-frequency furnace cast irons made from pig iron, steel scrap, and ferroalloys superheated to different temperatures. The irons were untreated in the ladle.

There is a slow rise in strength with increased temperature at the low end of the temperature scale followed by an abrupt drop in strength, reaching a minimum at around 2750° F., and then another slow rise as the temperature is fur-

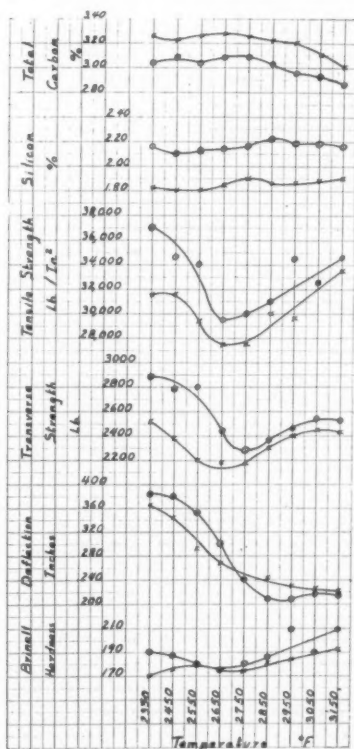


Fig. 1—Effect of Heating Temperature on the Properties of Two Cast Irons Melted in a High Frequency Furnace and Receiving No Ladle Treatment.

low notch sensitivity, and to widen our knowledge of engineering qualities and compositions of cast iron

*Supervising Metallurgist, Battelle Memorial Institute, Columbus, Ohio. †An address before Cincinnati District Chapter, American Foundrymen's Association, February 13, 1940.

ther increased. This peculiar behavior in the strength as a result of superheating can be readily followed from the structural changes in the iron as rather marked changes in the structure accompany the changes in properties.

In Fig. 2 are shown properties of similar irons heated over the same temperature range but treated in the ladles with ferrosilicon and with calcium silicide. In contrast to the untreated irons, the structure of the treated iron is fully pearlitic and contains no graphite in the dendritic pattern. The size of the graphite flakes decreases somewhat with in-

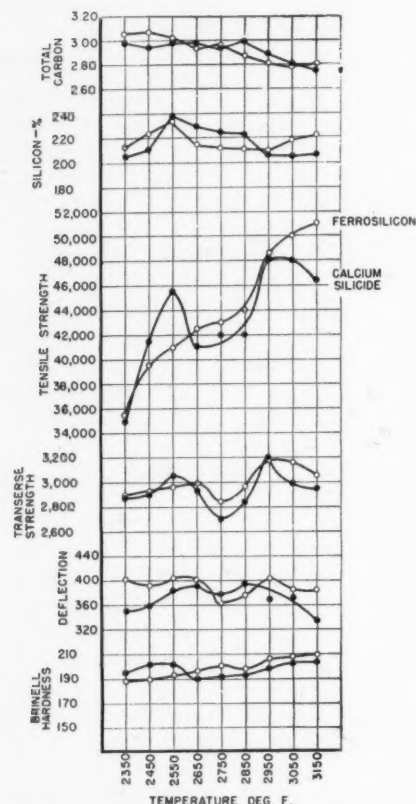


Fig. 2—Effect of Heating Temperature on the Properties of Two Cast Irons Melted in a High Frequency Furnace and Treated in the Ladle with Ferrosilicon and with Calcium Silicide.

crease in metal temperature. That probably accounts for the unusual effect of metal temperature on properties. Provided ladle additions can be employed, metal heating temperature is sometimes more influential than most alloy additions on strength, as seen by the fact that the tensile strength of the treated iron in this case is raised from 35,000 to 51,000 lb. per sq. in. by means of metal temperature alone.

The problem is to explain why cast iron is so sensitive to metal temperature and to other factors in its manufacture. Why are ladle additions so effective at times? It can

be rightly said that all of this is still an air-tight mystery to us, though with several individuals and laboratories studying the problem it may not remain a mystery long. When it is solved we can then begin to apply reasoning in outlining operations for melting gray iron so as to produce certain results. That is being done by rule of thumb methods now.

Boyles at Battelle has worked on various phases of the problem for the past four years. The ground covered in his researches has been wide; nevertheless there is still an enormous amount of work to do.

Sulphur Influence

One very interesting result of his work that is of general interest has been the realization that sulphur has a profound influence upon maintaining the proper structure in the iron. Boyles showed that in the absence of sulphur the graphite tends to separate in dendritic form, giving the iron very poor mechanical properties. The structure of a sulphur-free iron is shown in Fig. 3. On increasing the sulphur content of this grade of iron the graphite becomes flake-like in form, the flakes increase in size, finally reaching a maximum beyond which their size decreases with increase in sulphur. This is shown in Fig. 4.

Heat Treatment

While there is only a minimum of heat treating being done on cast iron

now, certain developments are in progress that are likely to profoundly alter our attitude towards heat treated iron. We can look forward to the time when each progressive gray iron foundry supplying a variety of casting to the trade will have its heat treating department or will be obliged to send out certain of its work for heat treatment.

Greater Use of Scrap

One trend in gray iron foundry practice has been the use of greater percentages of steel and scrap in cupola charges. It goes back, of course, to the desire to lower the carbon content and to make stronger irons. There has been a definite improvement in the pig iron in the last few years through the introduction of the smaller pig, a closer classification according to silicon, and greater uniformity in analysis of the pig in each carload lot made possible by the use of large mixers at the blast furnace. These changes in pig and in proportioning of the cupola charge tend toward better control of the analysis of the cast iron and allow the foundrymen much greater leeway in the range of analyses that can be furnished.

Auxiliary equipment for the cupola has been vastly improved. Hot-blast cupolas are being installed in some of the larger foundries to reduce the amount of coke per charge, to get hotter iron, and to lower the cost of melting. In some cases a hot-blast cupola will, it is under-



Fig. 3—Microstructure of Sulphur-Free Cast Iron Showing the Characteristic Distribution of Graphite in the Absence of Sulphur.—X100.

stood, be installed and allowed to pay for itself out of the coke savings it brings over previous cold-blast practice.

Air Control

It is only recently that attempts have been made to control accurately the quantity of air so as to maintain a constant stage of combustion within the fusion zone. Controlled combustion can be a definite source of fuel economy. Combustion within a cupola is almost entirely dependent upon the type and quantity of coke available in the combustion zone together with the amount of air used to burn it. Massari¹ describes a new control device which measures the relative amount of air entering the cupola and simultaneously records the carbon dioxide content of the effluent gases. These

¹The Foundry, Vol. 48, October 1939, pages 28-30, 98, 100.

two measurements are properly coordinated into an automatic control device consisting of a differential pressure recorder and a carbon dioxide recorder that regulates the blast so as to compensate for changing conditions in the combustion zone and obtain both uniform and efficient cupola operation. The cost of the equipment is less than \$1,000 plus installation expense, which is not in excess of \$300. A number of cupolas in member foundries of the Association of Manufacturers of Chilled Car Wheels have been equipped with such controls and their installation has resulted in definite real economy and better cupola regulation. This development should be watched closely by cupola operators, as it is bound to have a marked influence in the refinement of cupola operation. Figs. 5 and 6 taken from Massari's article show (1) the relation of carbon dioxide in the effluent gas to the

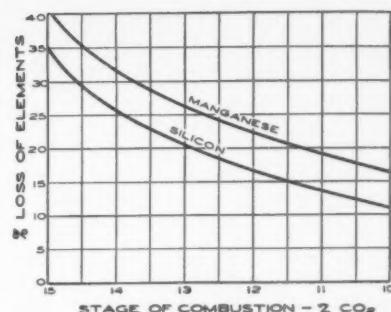


Fig. 5—Relation Between the Silicon and Manganese Losses During Melting and the Stage of Combustion.

manganese and silicon losses, and (2) the combined cost of the coke, and of the silicon and manganese lost for various conditions of cupola operation. While these curves apply for certain grades of iron, they are the general types of curves that would be obtained for any grade of cast iron melted in the cupola.

Cement Molds

One more recent development can be mentioned before passing on into a discussion of cast steel. Cement bonded sand is now coming into the picture in gray iron, in steel casting, and in non-ferrous casting practice. The Randupson process, as the cement molding process is known, uses silica sand bonded with ordinary Portland cement and water. The

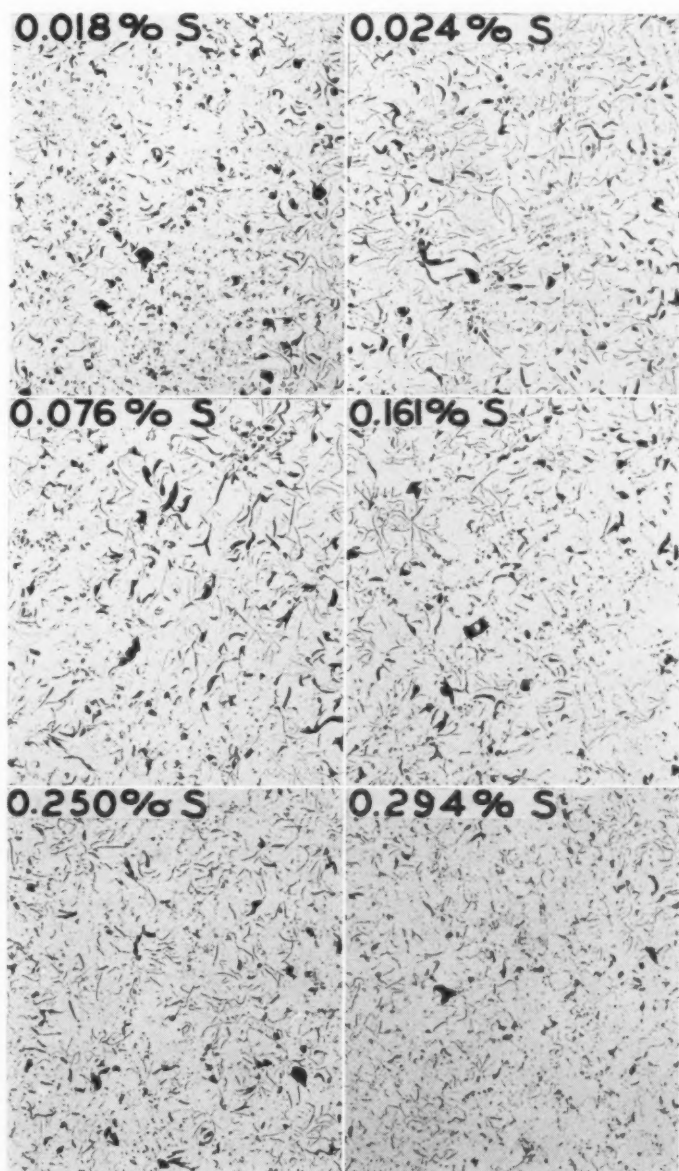


Fig. 4—Influence of Sulphur on the Size of Graphite in Cast Iron.

JUNE, 1940

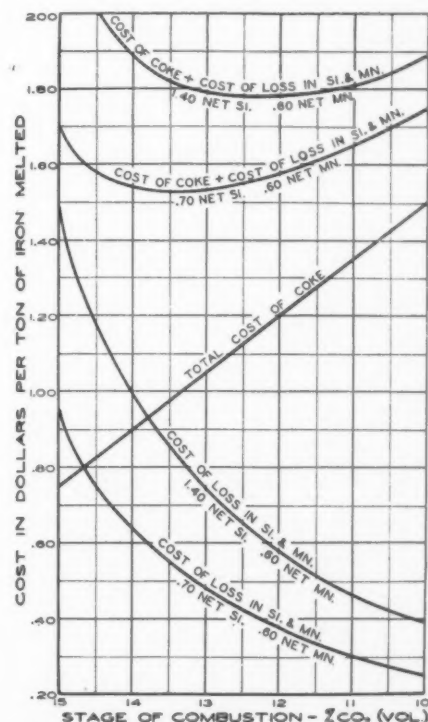


Fig. 6—Combined Cost of Coke and Manganese Lost for Various Stages of Combustion.

amount of water added is such that the cement is subhydrated only. The cement proportions vary from 3 to

(Continued on Page 25)

NEW MEMBERS

The new members reported here are those enrolled after those listed in the May issue and up to May 2. A large number were added during the convention as a result of the organized membership drive under the committee of 100, the chairman of which is past President James L. Wick, Jr. Through the efforts of this committee, cooperating with the chapters, a large number of guests attending the convention took out membership of sustaining, company and personal classes. These will be reported in the July issue of **AMERICAN FOUNDRYMAN**, which will show that our past membership record is being well exceeded.

Birmingham Chapter

J. Arthur Hill, Goslin-Birmingham Mfg. Co., Birmingham, Ala.

Buffalo Chapter

William J. Conley, Prof. Applied Mechanics, University of Rochester, Rochester, N. Y.
Leonard O. Fines, Sand Technician, Lancaster, N. Y., Gould Coupler Corp., Depew, N. Y.
Lancaster Malleables & Steel Corp., Lancaster, N. Y. (B. R. Weidle, Vice President)*

Canadian Section

W. B. Thompson, Supt., Shawinigan Chemicals, Ltd., Stainless Steel & Alloys Division, Shawinigan Falls, Que., Canada

Central Indiana Chapter

Robert R. Arnett, Secretary, American Art Alloys, Inc., Kokomo, Ind.
Warren B. Ballantine, Fdry. Foreman, Haynes-Stellite Co., Kokomo, Ind.
Clay Bush, Vice Pres. and Mgr., Indianapolis Brass & Aluminum Foundry, Inc., Indianapolis, Indiana
Floyd Grant, Fdry. Foreman, Haynes-Stellite Co., Kokomo, Ind.
Peter Healey Brass Foundry Co., Evansville, Ind. (Stephen W. Cook, Jr., Owner)*
Arthur R. Springer, Treas.-Mgr., Springer Whitaker Foundry Co., Terre Haute, Ind.

Chicago Chapter

S. J. Babusek, Owner, Star Aluminum & Brass Foundry, Chicago, Ill.
Calumet Foundry & Machine Co., East Chicago, Ind. (C. A. Creahan, President)*
Leonard A. Colangelo, Fdry. Met., International Harvester Co., Chicago, Ill.
F. J. Cook, Sales Dept., Harnischfeger Corp., Chicago, Ill.
L. J. Haga, Assoc. Prof. Metallurgy, Lewis Institute, Chicago, Ill.
Leonard Lynch, Lab. Asst., International Harvester Co., Chicago, Ill.
Craig A. Mills, Practice Apperntice, Carnegie-Illinois Steel Corp., Chicago, Ill.
F. J. Smith, Supt., Calumet Foundry & Machine Co., East Chicago, Ind.
Frank Urbaytis, Chemist, American Brake Shoe & Foundry Co., Melrose Park, Ill.

*Company Members.

Wisnick Accurate Match Plate Co., Chicago, Ill. (Chas. F. Beeler, Sales Mgr.)*

Detroit Chapter

Bay City Foundry Company, Bay City, Mich. (D. W. Clark, Sec'y-Treas.)
Gordon H. Curtis, Test Engr., Harry W. Dietert Co., Dertoit, Mich.
A. F. Dosey, Secretary-Treasurer, Ann Arbor Foundry Co., Ann Arbor, Mich.
S. G. Lakin, Manager, Stuart Foundry Company, Detroit, Mich.
Edward C. Mathis, Metallurgist, Interlake Iron Corp., Toledo, Ohio
John W. Zimmerman, Jr., Engineer, Semet-Solvay Company, Detroit, Mich.

Metropolitan New York Chapter

Thomas C. Flinn, Consulting Engineer, New York, New York

Metropolitan Philadelphia Chapter

Herbert H. Cato, Philadelphia, Pa., Repr., Swan Finch Oil Corp., New York, N. Y.

Northeastern Ohio Chapter

Walter L. Chatfield, Fdry. Supt., The Fate-Root-Heath Co., Plymouth, Ohio
R. W. Eichenberger, Purch. Agent, Acme Foundry Corp., Cleveland, Ohio
O. R. Hanchett, Fdry. Supt., Ohio Injector Co., Wadsworth, Ohio
The Holub Iron & Steel Co., Akron, Ohio (Daniel C. Holub, President)*
Jack Levand, President, Levand & Co., Cleveland, Ohio.
C. T. Locke, Supt., Acme Foundry Corp., Cleveland, Ohio
Bailey I. Ozer, Treas., M. Cohen & Son Co., Cleveland, Ohio
John J. Potts, Works Chemist, American Steel & Wire Co., Cleveland, Ohio
Vincent J. Sedlon, Owner, Master Pattern Co., Cleveland, Ohio
Wilbur A. Thomas, Fdry. Foreman, Kilby Mfg. Co., Cleveland, Ohio.
The A. C. Williams Co., Ravenna, Ohio (J. B. Heisler, Treas.)*

Northern Illinois-Southern Wisconsin Chapter

Daniel E. Clifford, Repr., Hickman-Williams & Co., Chicago, Ill.
F. W. Dixon, Jr., Sales Engineer, Gunitite Foundries Corp., Rockford, Ill.
George Schwenkner, Molding Foreman, Gunitite Foundries Corp., Rockford, Ill.

Northern California Chapter

Michael Canepa, Asst. Foreman, Enterprise Foundry Co., San Francisco, Calif.
Martin Ginty, Pacific Steel Casting Co., Berkeley, California
Frank Lopez, Molder, Pacific Steel Casting Co., Berkeley, Calif.
H. R. Penning, Foreman, Enterprise Foundry Co., San Francisco, Calif.

William C. Townsend, Pattern Maker Foreman, Enterprise Foundry Co., Dept. "H," San Francisco, Calif.

Ontario Chapter

T. Donald Barnes, Sales Manager, Wm. R. Barnes Co., Ltd., Hamilton, Ont., Canada
W. A. Bynum, Canadian Foundry Supplies & Equipment, Ltd., Toronto, Ont., Canada
Arthur G. Hawthorne, Manager, Canadian Foundry Supplies & Equipment, Ltd., Toronto, Ont.

Quad City Chapter

Walter E. Brandt, Metallurgist, Zimmerman Steel Co., Bettendorf, Iowa
H. A. Curtis, Metallurgist, Rock Island Arsenal, Rock Island, Ill.
Wm. R. Hodgson, Foreman, International Harvester Co., Rock Island, Ill.
Fred G. Kallous, Foundry Foreman, Zimmerman Steel Co., Bettendorf, Iowa
Martin Liedtke, Foreman, International Harvester Co., Rock Island, Ill.
Pekin Foundry & Mfg. Co., Pekin, Ill. (A. V. Martens, President)*

St. Louis Chapter

C. G. Eickmeyer, Mgr. of Fdry. Engineers, Sorbo-Mat Process Engineers, St. Louis, Mo.

*Company Members.

Northern Calif. Meeting

(Continued from Page 18)

sea diving and the Fair. A. Lee Bennett, Gladding McBean & Co., the technical speaker of the evening, covered ceramics from the earliest known records to the present advanced methods of production, manufacture and use.

Without question, this meeting had one of the snappiest, most diversified and interesting programs that our committee has staged. In the first place, there was a touch of showmanship in the showing of Fair pictures, as the Exposition will be open again on May 25, and then, of course, everybody is thrilled with the deep sea diver stunts.

Mr. Bennett, representing the Pioneer Clay Products Co. of the West, came up from the south, especially to keep a promise made by his company several months ago, to give us an evening's instruction. He not only renewed earlier acquaintances, he made new ones and incidentally made friends of some foundrymen. It was suggested that we confer upon him the honor-

ary degree of Doctor of Mud and Rocks. Our chairman, Sam Russell, reported our ailing members on the mend, and made mention several times of the big "Ladies' Night" scheduled for June 14,

Chicago Chapter Sponsors Smoker at Convention

NEARLY 800 foundrymen gathered in the Red Lacquer room, Palmer House, Chicago, on Tuesday evening, May 7, to attend a stag smoker sponsored by the Chicago Chapter of A.F.A., convention hosts. The event was staged for the purpose of welcoming the out-of-town guests and to promote acquaintanceship among the foundrymen attending the convention—an informal "get-together" event. Refreshments were served and a fine show was enjoyed by those who attended.

The event was planned and staged by a committee of the

Wisconsin Chapter

R. L. Lee, Sec'y-Treas., The Liberty Foundry, Inc., Wauwatosa, Wis.
Thomas Henry Staffin, Foreman, Sand Labs. Research Dept., Allis-Chalmers Mfg. Co., West Allis, Wis.
Walter H. Underwood, Repr., Hickman, Williams & Co., Chicago, Ill.

Outside of Chapters

Charles Chadwick, Metallurgist, Meehanite Metal Co., Pittsburgh, Pa.
C. D. Coffman, Partner, Superior Brass & Aluminum Casting Co., Lansing, Mich.
John Doerfner, Jr., Erie Malleable Iron Co., Erie, Pennsylvania
Louis J. Gagnon, Supt., Manning, Maxwell & Moore, Inc., Boston, Mass.
H. R. Langman, Supt., Fairmont Railway Motors, Inc., Fairmont, Minn.
Enrique Molina P., Engineer, Carlos Molina E Hijos, San Pedro De Los Pinos, D. F., Mexico
Charles W. Ohly, Farrell-Birmingham Co., Ansonia, Conn.
Paxton-Mitchell Company, Omaha, Neb. (James L. Paxton, Jr., President)*
Superior Brass & Aluminum Casting Co., Lansing, Mich. (M. B. Fiandt, Partner)*
Hildebrando A. Werneck, Technical Manager, Laminacao e Artefatos, de Ferro S. A. Recife, St. Pernambuco, Brazil

Chicago Chapter under the chairmanship of J. H. Abbott, Hichman, Williams & Co., Chicago, Ill.

Old Timers Gather

(Continued from Page 8)

a book in which all foundrymen having 25 or more years of service were invited to register. Upon registering, 25- and 50-year service buttons were presented to those entitled to them.

A check of the registration book shows that 896 men registered, with a total service record of 32,470 years. Seventy-two had records of 50 years or more. Thirty-five states were represented, as well as two Canadian provinces and one in Mexico.

The idea of the "Old Timers" booth was conceived and sponsored by E. W. Beach, engineering executive, and W. J. Barkley, personnel director of the C.W.C.Co. Much credit should go to these men for the sponsoring of this interesting project.

ABSTRACTS

NOTE: The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman*, from current technical and trade publications. When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Alloy Steels

ALLOYING ELEMENTS. "How Alloying Elements Affect High Alloy Steels," by P. Payson, *Iron Age*, April 18, 1940, vol. 145, no. 16, pp. 31-35. Summarized in this article by the author in a very understandable manner are the effects which the various elements produce in high alloy steels. The author also indicates how variations in the properties of these steels are controllable to an appreciable degree. The functions of alloy additions are described, and detailed data are given for manganese, nickel and cobalt steels. (S.)

Aluminum Castings

CLEANING. "Cleaning Aluminum-Alloy Castings," *Foundry Trade Journal*, February 22, 1940, vol. 62, no. 1227, p. 153. Core knock-out, chipping, sawing, grinding and polishing are normally executed with the standard tools developed for these purposes, although certain modifications in the tool operation may be required to gain the best results with aluminum. Hence the selection of tools and materials depends on the size and shape of castings to be finished, and on the nature of the finish required. The recommendations in this article are just general practices and may require adjustment in some cases to provide the most efficient finishing system for particular plant conditions and casting design. (C.I.)

Aluminum-Silicon Alloys

PROPERTIES AND APPLICATION. "Aluminum-Silicon Alloys," by George Sachs, *Metal Industry* (London), March 1, 1940, vol. 36, no. 9, pp. 203-206. In this paper the author summarizes his extensive experience in the field of aluminum-silicon alloys. The influence of silicon content and of the presence of various metallic additions is discussed, and details are given of the characteristics and heat-treatment of the aluminum-silicon-magnesium-type alloys developed by the author. (A1.)

Brass

IMPURITIES. "Impurities in the Brass Foundry," by G. F. Beard, *Canada's Foundry Journal*, March, 1940, vol. 13, no. 3, pp. 8-9. This article discusses the influences of impurities in foundry brasses and bronzes. These impurities may be classified as gases, metallic impurities, or insoluble non-metallic impurities. Some of the impurities and their effects are listed in this paper—they are: Aluminum, antimony, arsenic, bismuth, cadmium, iron, magnesium, manganese, nickel, phosphorus and silicon. (N.F.)

Castings

CONTINUOUS. "Continuous Casting," by E. R. Williams, *Steel*, April 8, 1940, vol. 106, no. 15, pp. 48-49, 56, 58, 81. After nine years of research work, Williams Engineering Co. announces a new process for continuous casting of ferrous and non-ferrous metals into ingots of indefinite length and extremely high quality metal. This brand new method employs a scheme which removes heat from congealing metal fast enough to

avoid rupture of solidifying skin as the ingot moves continuously from the mold. There are no surface imperfections to be chipped or ground out, and pipes and cavities are practically eliminated. Loss of metal in top sections of ingots is also eliminated. (C.)

STRESS RELIEF. "Stress-Relieved Cast Irons," by A. Le Thomas, *Foundry Trade Journal*, March 21, 1940, vol. 62, no. 1231, pp. 217-218, 232. A brief paper presented in "La Fonte" and translated for this magazine. It concerns the facts of stress relieving iron, what it is or means to the foundryman, causes of internal stresses and how it occurs and effects castings, and suggested remedy or solution for internal stresses. (C.)

Cast Iron

CHROMIUM-SILICON. "Chromium-Silicon Cast Iron," by A. L. Norbury and E. Morgan, *Foundry Trade Journal*, February 15, 1940, vol. 62, no. 1226, pp. 137-141. This paper contains a survey of the micro-structures; tendency to chill; mechanical properties, such as Brinell hardness, machinability, tensile strength, transverse strength and deflection; and air and oil hardening capacities of cast irons having chromium contents between 0 and 15 per cent and silicon contents between 1 and 11 per cent. The conclusions which the author has made from this investigation are interesting and valuable. (C.I.)

CUPOLA ALLOYING. "Cupola Operation for Making Alloyed Cast Iron," *Foundry Trade Journal*, vol. 62, no. 1220, January 4, 1940, p. 8. Conditions prevailing in foundries vary greatly, making it difficult to lay down any hard and fast rules on cupola operation. Successful operation depends on the adherence to definite principles and a fixed plan of working. In this article, the discussion centers around making up sand bottom, weight of charges, height of coke bed, igniting the coke bed, soaking period, order of charging, tapping and collection of metal, and slagging the cupola. (C.I.)

FLAME HARDENING. "Flame Hardening Cast Iron," by R. O. Day, *Steel*, vol. 106, no. 19, May 6, 1940, pp. 46-49. Many cast irons can be flame hardened successfully with simple equipment and technique. The outstanding feature of flame hardening is the way in which the heat and subsequent quench are applied to the surface under treatment with such speed as to prevent penetration for more than a small fraction of an inch below the surface. Most commonly, combined carbon in the cast iron should be 0.60 to 0.80 per cent to be flame hardened. Alloy irons are also discussed and are found to be hardenable. (C.I.)

GASES. "A Preliminary Study of Gases in Cast Iron," by Wm. Y. Buchanan, *Foundry Trade Journal*, vol. 61, no. 1219, December 28, 1939, pp. 443-446. It is the object of this paper to consider the gas which is brought to the mold, dissolved in the cast iron itself, and is likely to come out of solution during solidification. The author goes on to point out that the general causes of gas holes are gases from mold

surface, cores, excessive ramming and so forth. The paper describes in detail the experiments worked out on cast iron and the author's method for determining gas volume in cast iron. The effects of soda ash and wet ladle, along with the type furnace used in this study, are discussed by the author. (C.I.)

HIGH TEST. "High Test Iron," by J. C. Stavert, *Canadian Metals and Metallurgical Industries*, March 1940, vol. 3, no. 3, pp. 62-65. For the purposes of this article, high test iron is considered one having a tensile strength of 40,000 lb. per sq. in. and over. This discussion is also limited to cupola-made iron due to the fact that a large bulk of cast iron is made in the cupola. Good cupola practice is considered. The importance of alloy additions is also shown. (C.I.)

MACHINE TOOL. "Cast Iron and Its Relation to Machine Tools," by P. A. Russell, *Foundry Trade Journal*, March 14, 1940, vol. 62, no. 1230, pp. 205-207. This paper is divided into two headings; cast iron as a material for the construction of machine tools, and the working of cast iron upon machine tools. Reasons for cast iron being the traditional metal in building machine tools are, ease of casting into fairly intricate shapes; low cost, compared with other metals; rigidity; and reasonable resistance to wear. The author discusses each one of these reasons individually. (C.I.)

Cupola

BALANCED BLAST. "The Balanced-Blast Cupola and Fluidity," by W. Y. Buchanan, *Foundry Trade Journal*, February 15, 1940, vol. 62, no. 1226, pp. 133-134, 141. This is the conclusion to the continued article by the author and he discusses the effects that ramming, moisture, graphite, temperature, silicon, sulphur, phosphorus, lead and copper have on fluidity. (F.)

Design

PATTERN-MAKING. "Modern Ideas in Pattern-making," *Canada's Foundry Journal*, March, 1940, vol. 13, no. 3, pp. 22-24. The pattern shop and foundry should work in harmony in order to produce castings as quickly and as cheaply as possible and all efforts in this direction should be encouraged. The pattern-maker should have a good knowledge of drawing office and foundry practice. (P.)

SAND OR DIE CAST. "Die Cast or Sand Cast," by Herbert Chase, *Product Engineering*, April, 1940, vol. 11, no. 4, pp. 165-168. This is a comparison of two casting processes and which are investigated under the following headings for their respective advantages and disadvantages: Tooling costs, production rates, material costs, machining costs, finishing costs, self-fastenings and inserts, strength and ductility, hardness and temperature effects. The production of washing machine housings and business machine parts manufactured by the two processes are discussed. (D.)

Desulphurization

PIG IRON. "Desulphurization of Pig Iron," *Iron Age*, March 14, 1940, vol. 145, no. 11, p. 37. Results of additional investigation of slag-metal reactions, important in the smelting of iron ores, has been reported by the Bureau of Mines. The idea of main importance in this report was the development of a mechanical dispersing unit for adding finely ground calcium carbide to large quantities of molten cast iron. The object of this test was to see how completely the sulphur could be eliminated by this method of treatment. (C.I.)

Malleable

PRODUCTION. "Malleable Cast Iron," by H. G. Hall, *Foundry Trade Journal*, March 21, 1940, vol. 62, no. 1231, pp. 223-224, 226, 228. Although the author explains there are several types of malleable cast iron, softening of these irons is still controlled by (1) decarburization, basis of making whiteheart and (2) graphitization, basis of making blackheart. Explaining the graphitization stage first the author divides this into two main stages: (1) heating to and holding at a predetermined maximum temperature until all the free cementite has been dissolved and the structure consists of saturated austenite and free graphite, and (2) cooling to just below the critical temperature and holding there if necessary. The normal and quick annealing cycles are discussed. Decarburization is also explained, with also an explanation on "picture frame iron" and hardness of malleable iron. (C.I.)

Melting

CUPOLA. "The Melting Process in the Foundry," *Canada's Foundry Journal*, March, 1940, vol. 13, no. 3, pp. 20-22. The subject of desulphurization of molten iron has been an important one; in this article four methods for desulphurizing iron are discussed. A study of the cupola platform is made showing its importance as a handling station for charging materials, the necessity of keeping such a platform clean and tidy and having space enough to store necessary supplies. The blower room is also discussed. (F.)

Merchandising

CASTINGS. "Merchandising Jobbing Castings," by H. S. Washburn, *California*, March, 1940, vol. 30, no. 3, pp. 22, 34-36. This is an article prepared by the President of the American Foundrymen's Association and presented at the Regional Conference of the Northern and Southern California Chapters, A.F.A., held in conjunction with the 16th Annual Iron, Steel and Allied Industries Conference, Del Monte, Calif., Feb. 8, 1940. The author gives his version of price fixing, co-operation between customer and foundryman in the making of patterns and castings, what strides the American Foundrymen's Association has taken to help the industry in combating problems of modern day shop practice and what improvements and developments are taking place in the foundry business today. This article also

appeared in the March, 1940, number of the *American Foundryman*. (C.)

Steel

DEOXIDIZERS. "Deoxidizers Used in Steel Manufacture," *Foundry Trade Journal*, vol. 62, no. 1236, April 25, 1940, pp. 309-310. The term deoxidation has been changed in the past few years to mean not just deoxidation but also the elimination of inclusions. Any number of elements could be used to deoxidize steel and they include manganese, silicon, aluminum, chromium, titanium, zirconium, niobium, etc. The author discusses carbon, silicon and manganese, calcium, titanium and zirconium. Following the author's paper a discussion is presented.

Steel Castings

PULVERIZED COAL MELTING. "Use of Pulverized Coal as Fuel for Open Hearth Furnaces Melting Steel for Castings," by J. P. Kittredge, *Industrial Heating*, vol. 7, no. 3, March, 1940, pp. 236-238. An important single feature stressed in this article is the proper preparation of the coal, which should be not less than 90 per cent through a 240-mesh screen. Melters and first helpers should be carefully trained to be able to use the fuel properly. The intensely hot short flame causes melters to want to soften the flame to save the roof. It is also shown that the less coal burned, the less ash there is to combat. Regular inspection to keep checkers and flues clean will prevent the accumulation of a drift of ash which will stop the draft and cause the ash to accumulate very rapidly. Greater economy is or can be expected with the proper engineering study to perfect the equipment and adapt open hearth furnace design to the use of pulverized coal. (C.)

Steel Founding

PROGRESS. "Steel Foundry Progress in Melting and Heat Treating," by Edwin F. Cone, *Metals and Alloys*, vol. 11, no. 4, April, 1940, pp. 99-102. This article is the result of an analysis made on the Steel Founders' Society of America's periodical directory of steel foundries in the United States and Canada. These are facts and figures showing the number of electric melting furnaces, converter and crucible melting furnaces, open hearth steel furnaces and types of heat-treating furnaces employed in the steel industry during the year 1939. (S.)

Developments in Cast Metals

(Continued from Page 21)

15 per cent, while the total water in the mixture is from 2 to 9 per cent. The sand is milled for several minutes and, because of its setting characteristics, must be used within a few hours after being mixed. The molding practice departs from usual practices as the material is rammed around patterns mounted in wooden boxes, and the molds are then set aside, after stripping off the boxes, to harden for from 24 to 72 hours. Their surfaces are blackened, if necessary. The various parts are clamped together without any surrounding flask parts.

The molds have great mechanical strength and very high permeability. It is essential to preserve a well-defined ratio between the amount of water used and the quantity of cement to ensure high permeability.

At the present time large tonnages of carbon and alloy steels, cast iron, gunmetal, phosphor bronze, manganese bronze, aluminum alloys, and magnesium alloys are being cast abroad by this process and in weights from a few pounds to 30 to 40 tons. The process is also making headway in this country.

The cement bonding of molding sand has been the first major step away from the customary methods of preparing sand mixtures. The future for the cement molding process appears to be exceedingly bright.

(To be concluded in July issue.)

June Chapter Outing Schedule

June 8
St. Louis District
Joe Davies' Country Club
Outing
★
Northern Illinois-Southern Wisconsin
Svithiod Park, Rockford, Ill.
Outing
★ ★
June 12
Metropolitan Philadelphia
High Top Country Club
Aronomink, Del. Co., Pa.
Outing

June 14
Northern California
Lake Merritt Hotel, Oakland
Ladies' Night—Annual Meeting and
Dance
★ ★
June 15
Buffalo
Kudara's Farm, Hamburg, N. Y.
Outing
★
Quad City
Eagles Country Home
Outing

June 19th
Cincinnati District
Kenwood Country Club
Outing
★ ★
June 27th
Southern California
Clark Hotel, Los Angeles
Technical Meeting
★ ★
June 29
Northeastern Ohio
Lake Forest Country Club
Hudson, Ohio
Outing

ELEMENTS DISCUSSED

Aluminum
Bismuth
Carbon
Chromium
Cobalt
Copper
Magnesium
Manganese
Molybdenum
Nickel
Phosphorus
Silicon
Sodium
Sulphur
Titanium
Tungsten
Vanadium
Zirconium

PROPERTIES DISCUSSED

Tensile Strength
Hardness
Transverse Strength
Deflection
Compressive Strength
Shear Strength
Torsional Strength
Fatigue Strength
Impact Strength
Machinability
Wear Resistance
Heat Resistance
Corrosion Resistance
Mass and Section
Electrical Properties
Magnetic Properties
Thermal Conductivity
Thermal Expansion

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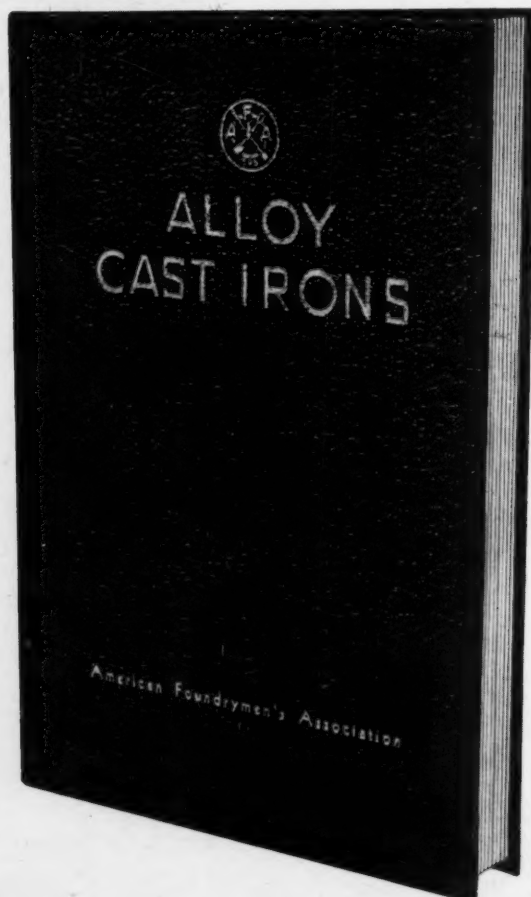
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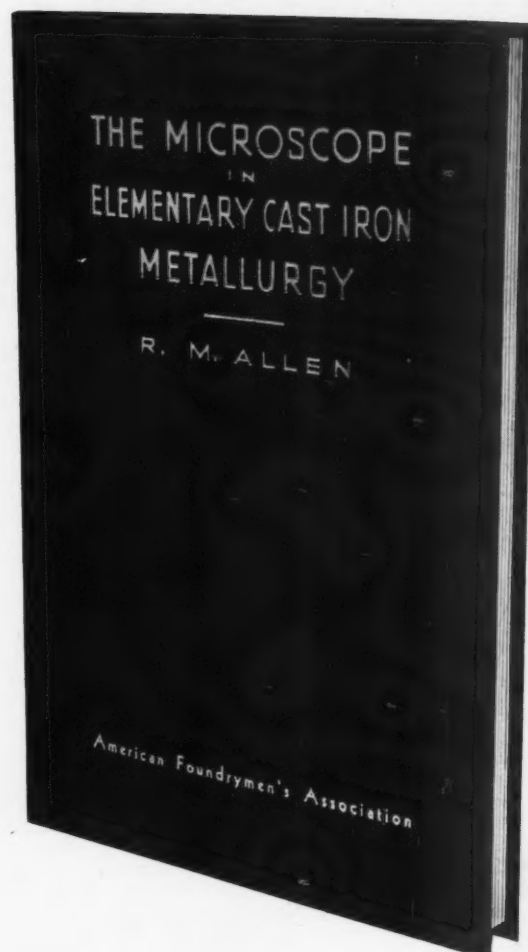
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